FIG. 1

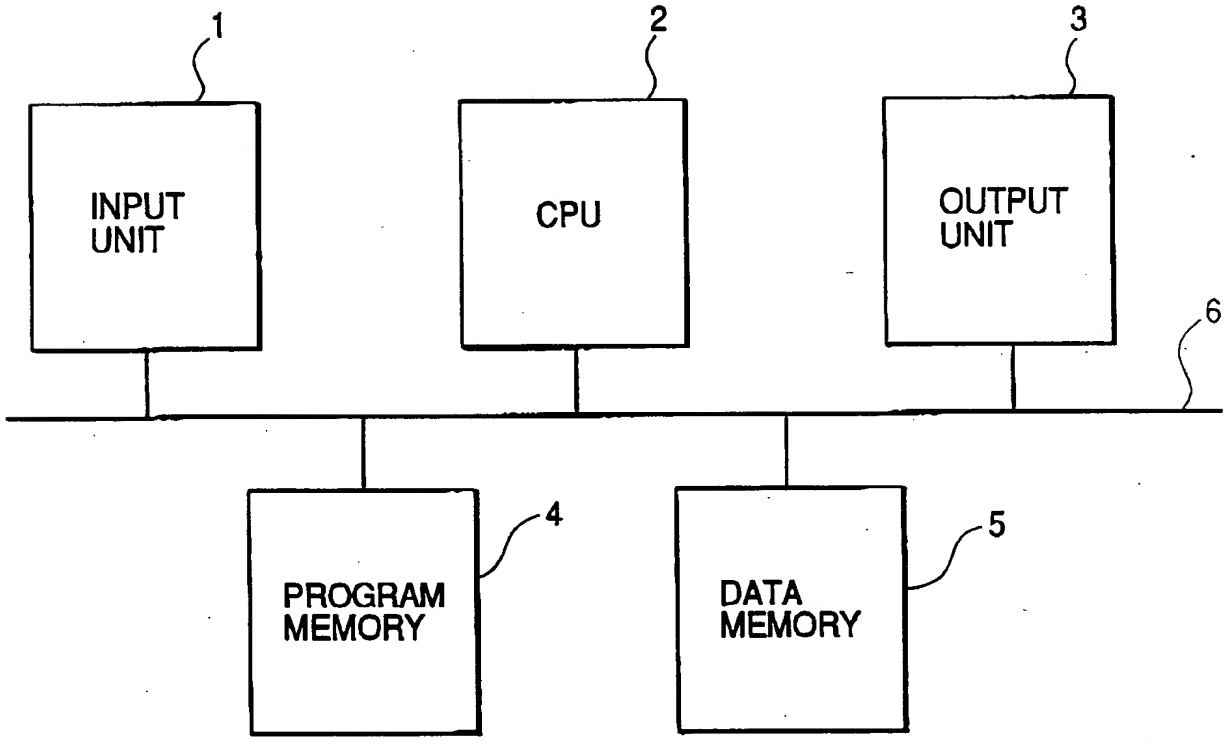

1
2
3
INPUT UNIT
CPU
OUTPUT UNIT
6
4
5
PROGRAM MEMORY
DATA MEMORY

FIG. 2

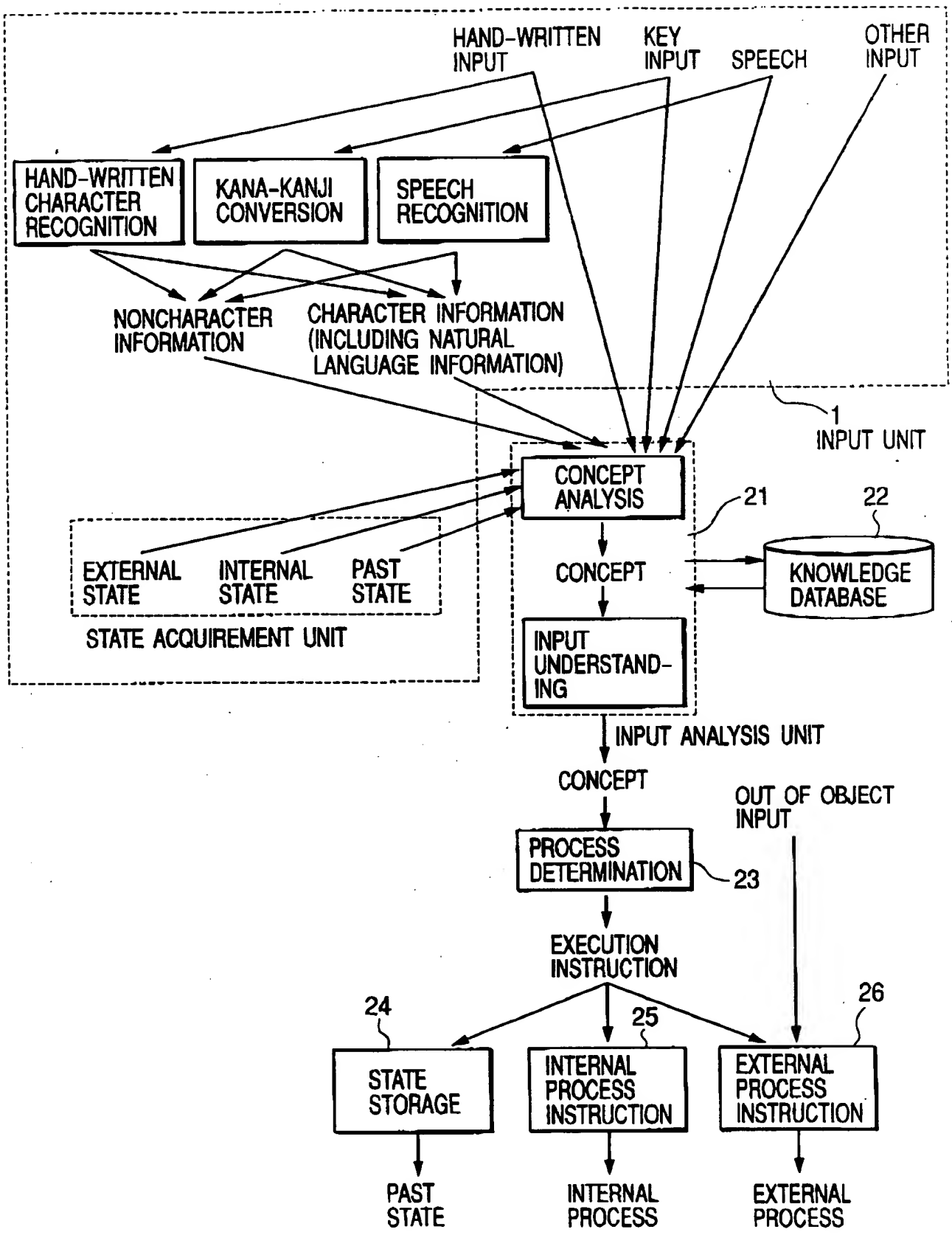

HAND-WRITTEN INPUT
KEY INPUT
SPEECH
OTHER INPUT
HAND-WRITTEN CHARACTER RECOGNITION
KANA-KANJI CONVERSION
SPEECH RECOGNITION
NONCHARACTER INFORMATION
CHARACTER INFORMATION (INCLUDING NATURAL LANGUAGE INFORMATION)
1
INPUT UNIT
CONCEPT ANALYSIS
21
22
EXTERNAL STATE
INTERNAL STATE
PAST STATE
CONCEPT
KNOWLEDGE DATABASE
STATE ACQUIREMENT UNIT
INPUT UNDERSTAND-ING
INPUT ANALYSIS UNIT
CONCEPT
OUT OF OBJECT INPUT
PROCESS DETERMINATION
23
EXECUTION INSTRUCTION
24
25
26
STATE STORAGE
INTERNAL PROCESS INSTRUCTION
EXTERNAL PROCESS INSTRUCTION
PAST STATE
INTERNAL PROCESS
EXTERNAL PROCESS

FIG. 3

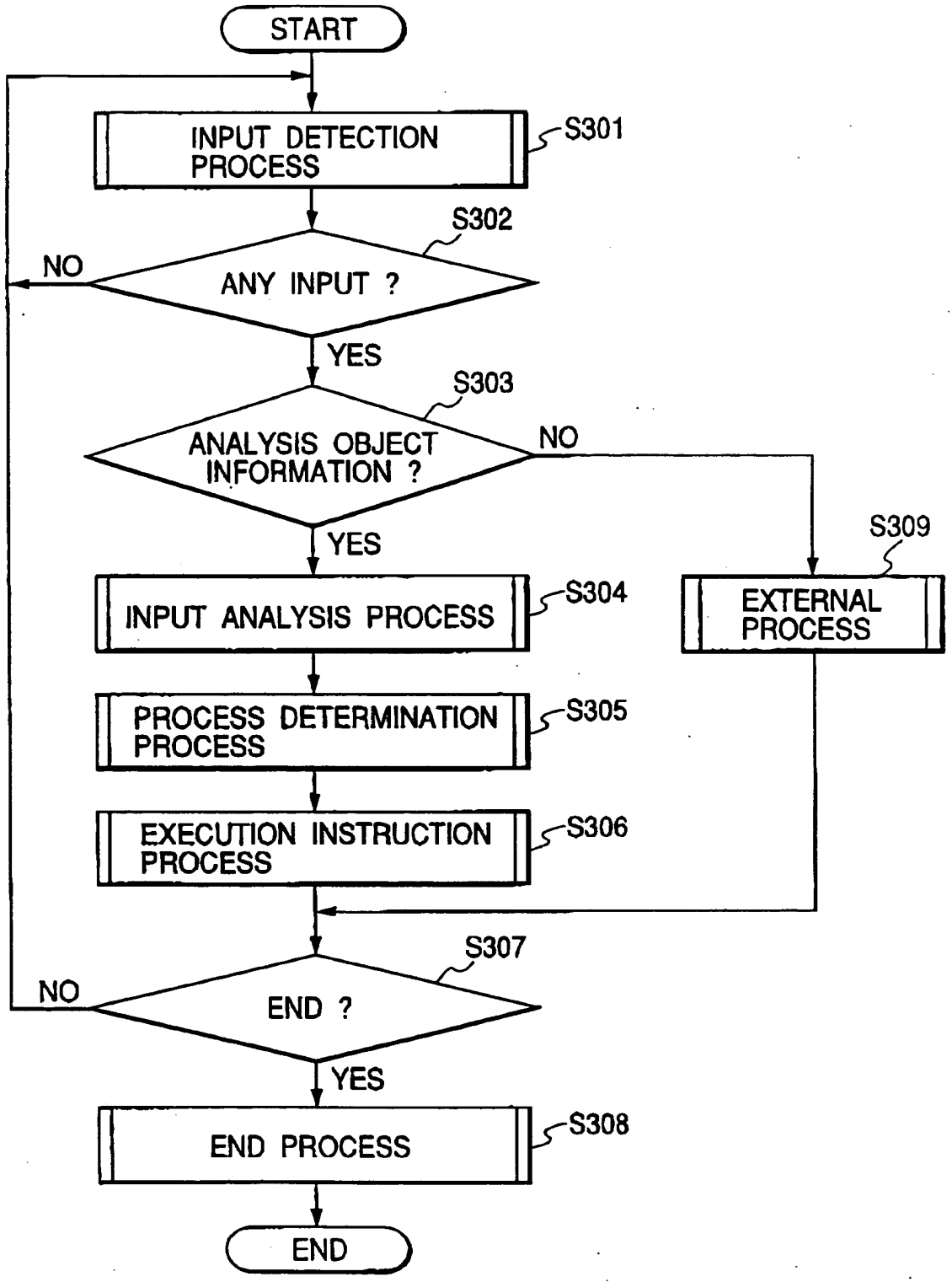

START
INPUT DETECTION PROCESS
S301
S302
ANY INPUT ?
NO
YES
S303
ANALYSIS OBJECT INFORMATION ?
NO
YES
S309
INPUT ANALYSIS PROCESS
S304
EXTERNAL PROCESS
PROCESS DETERMINATION PROCESS
S305
EXECUTION INSTRUCTION PROCESS
S306
S307
END ?
NO
YES
END PROCESS
S308
END

FIG. 4

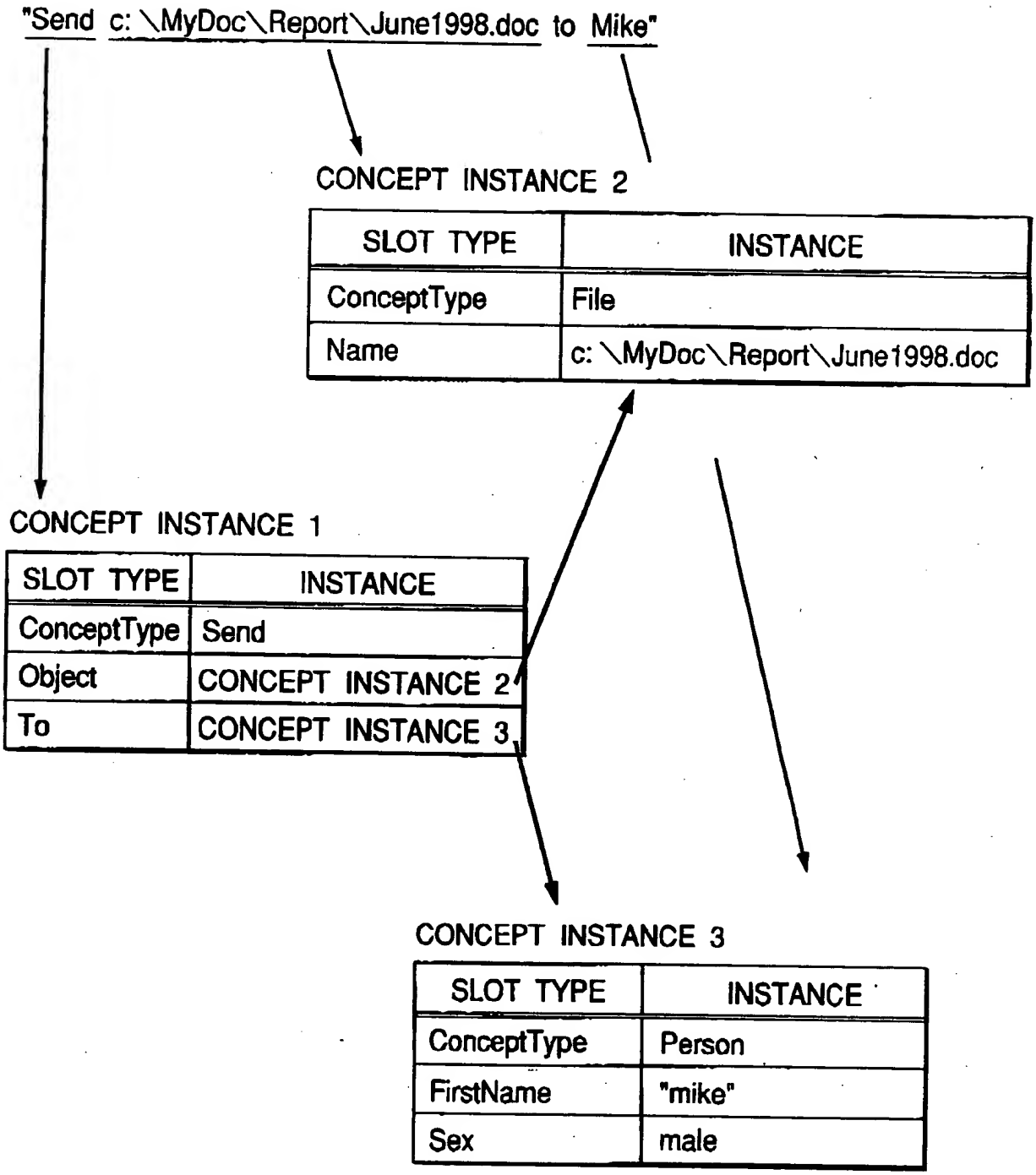

"Send c: \MyDoc\Report\June1998.doc to Mike"
CONCEPT INSTANCE 2
SLOT TYPE
INSTANCE
ConceptType
File
Name
c: \MyDoc\Report\June1998.doc
CONCEPT INSTANCE 1
SLOT TYPE
INSTANCE
ConceptType
Send
Object
CONCEPT INSTANCE 2
To
CONCEPT INSTANCE 3
CONCEPT INSTANCE 3
SLOT TYPE
INSTANCE
ConceptType
Person
FirstName
"mike"
Sex
male

FIG. 5

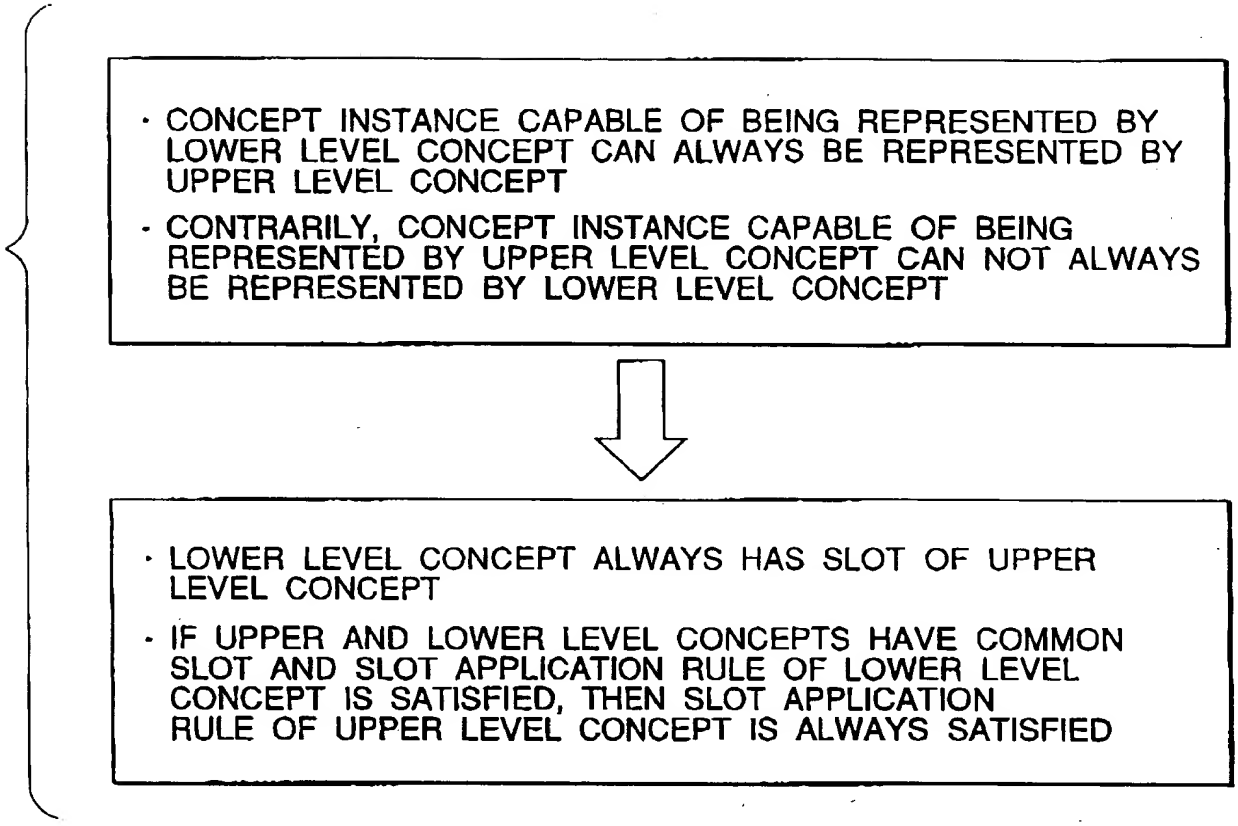


FIG. 7

CONCEPT "Concept" DEFINITION

SLOT TYPE	INSTANCE APPLICATION RULE	INSTANCE REQUEST RULE
ConceptType	Concept	Concept

FIG. 6

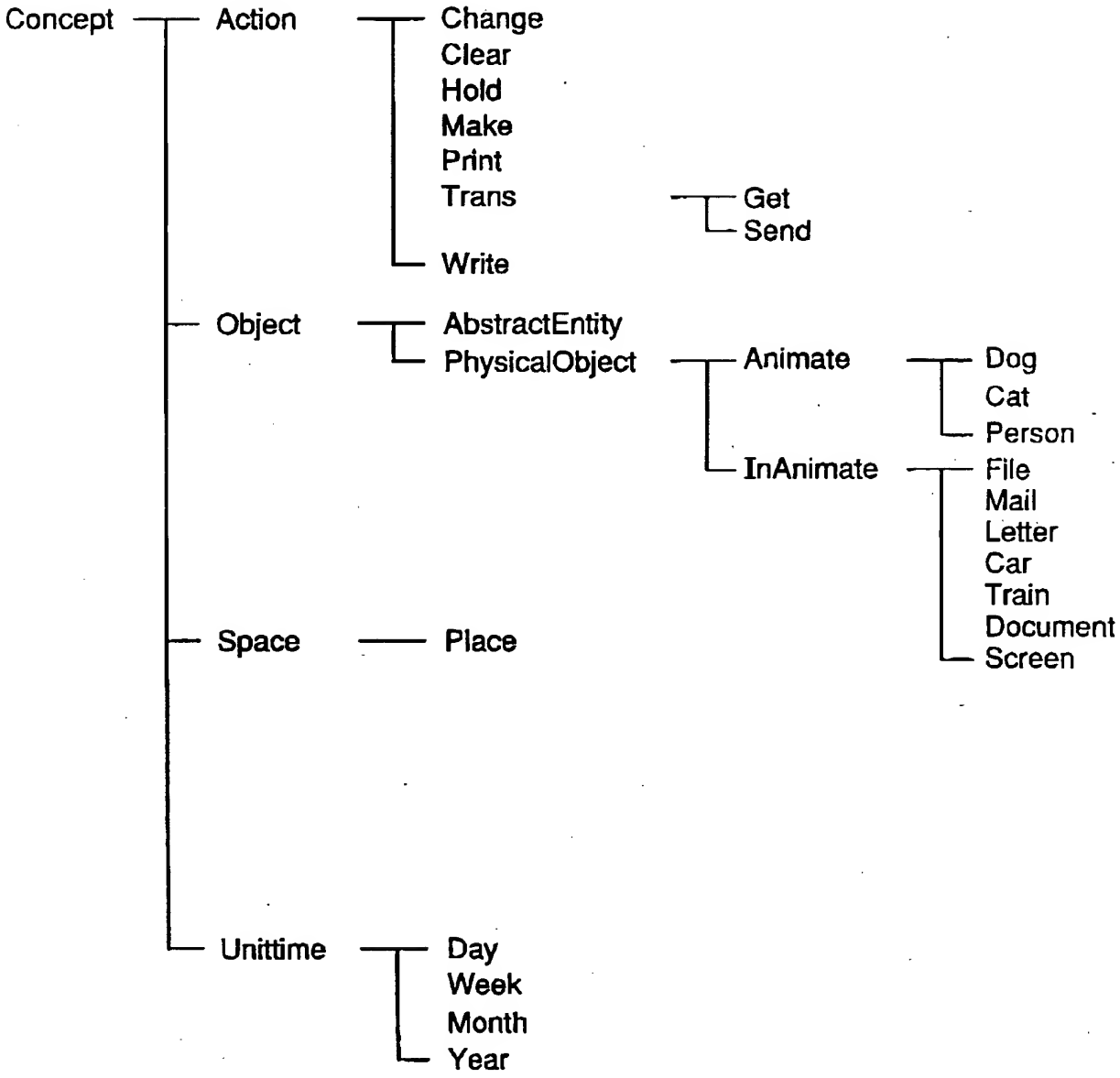

Concept
Action
Change
Clear
Hold
Make
Print
Trans
Get
Send
Write
Object
AbstractEntity
PhysicalObject
Animate
Dog
Cat
Person
InAnimate
File
Mail
Letter
Car
Train
Document
Screen
Space
Place
Unittime
Day
Week
Month
Year

FIG. 8

CONCEPT "Action" DEFINITION

SLOT TYPE	INSTANCE APPLICATION RULE	INSTANCE REQUEST RULE
ConceptType	Action	Action
Actor	List of <Person>	List of <Person>
Object	List of <Object>	List of <Object>
From	List of <Person> or <Space>	List of <Person> or <Space>
To	List of <Person> or <Space>	List of <Person> or <Space>

FIG. 9

CONCEPT "Trans" DEFINITION

SLOT TYPE	INSTANCE APPLICATION RULE	INSTANCE REQUEST RULE
ConceptType	Trans	Trans
Actor	List of <Person>	List of <Person>
Object	List of <Object>	List of <Object>
From	List of <Person> or <Space>	List of <Person> or <Space>
To	List of <Person> or <Space>	List of <Person> or <Space>

FIG. 10

CONCEPT "Get" DEFINITION

SLOT TYPE	INSTANCE APPLICATION RULE	INSTANCE REQUEST RULE
ConceptType	Get	Get
Actor	List of <Person>	List of <Person>
Object	List of <Object>	List of <Object>
From	List of <Person> or <Space>	List of <Person> or <Space>
To	=Actor	=Actor

FIG. 11

CONCEPT "Send" DEFINITION

SLOT TYPE	INSTANCE APPLICATION RULE	INSTANCE REQUEST RULE
ConceptType	Send	Send
Actor	List of <Person>	List of <Person>
Object	List of <Object>	List of <Object>
From	=Actor	=Actor
To	List of <Person> or <Space>	List of <Person> or <Space>

FIG. 12

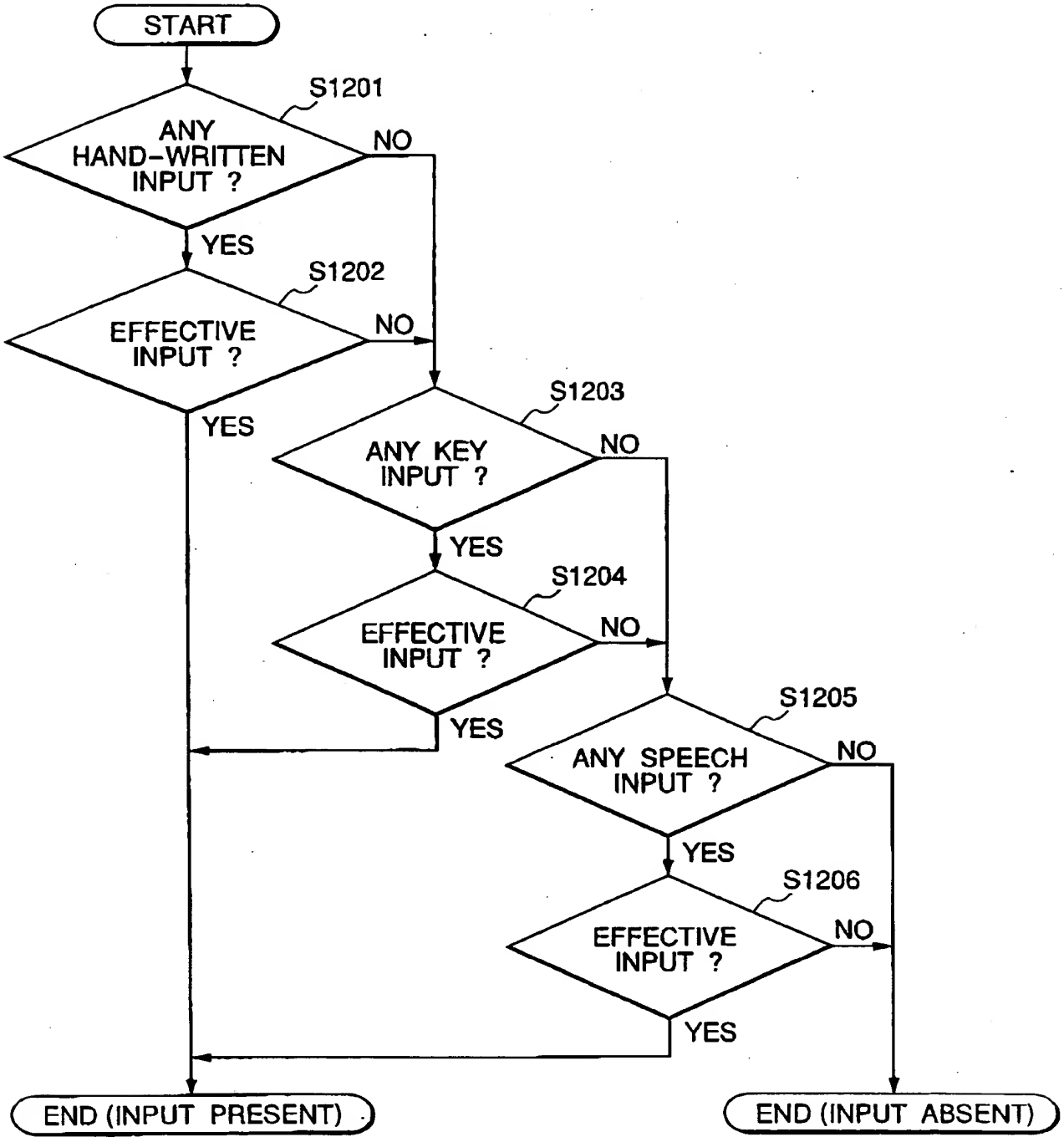

START
S1201
ANY HAND-WRITTEN INPUT ?
NO
YES
S1202
EFFECTIVE INPUT ?
NO
YES
S1203
ANY KEY INPUT ?
NO
YES
S1204
EFFECTIVE INPUT ?
NO
YES
S1205
ANY SPEECH INPUT ?
NO
YES
S1206
EFFECTIVE INPUT ?
NO
YES
END (INPUT PRESENT)
END (INPUT ABSENT)

FIG. 13

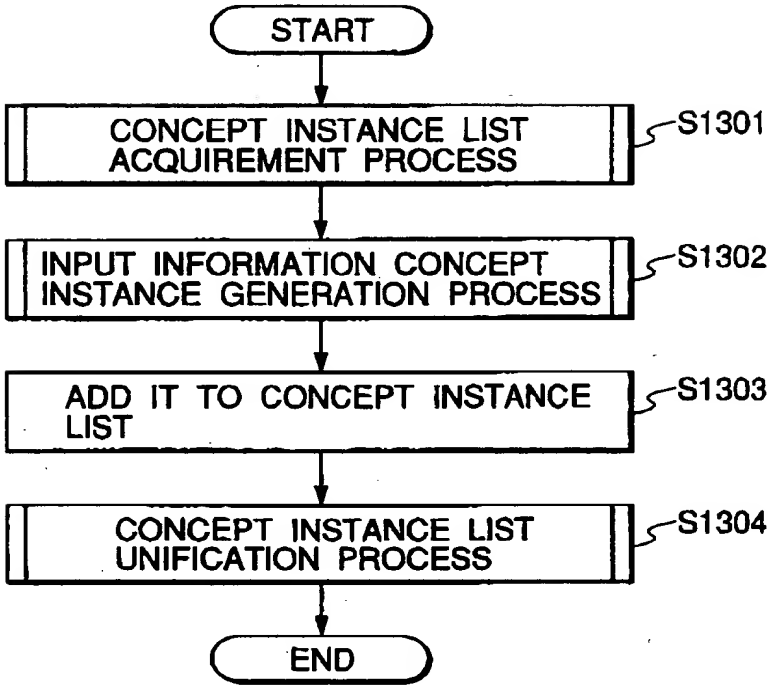

START
CONCEPT INSTANCE LIST ACQUIREMENT PROCESS
S1301
INPUT INFORMATION CONCEPT INSTANCE GENERATION PROCESS
S1302
ADD IT TO CONCEPT INSTANCE LIST
S1303
CONCEPT INSTANCE LIST UNIFICATION PROCESS
S1304
END

FIG. 14

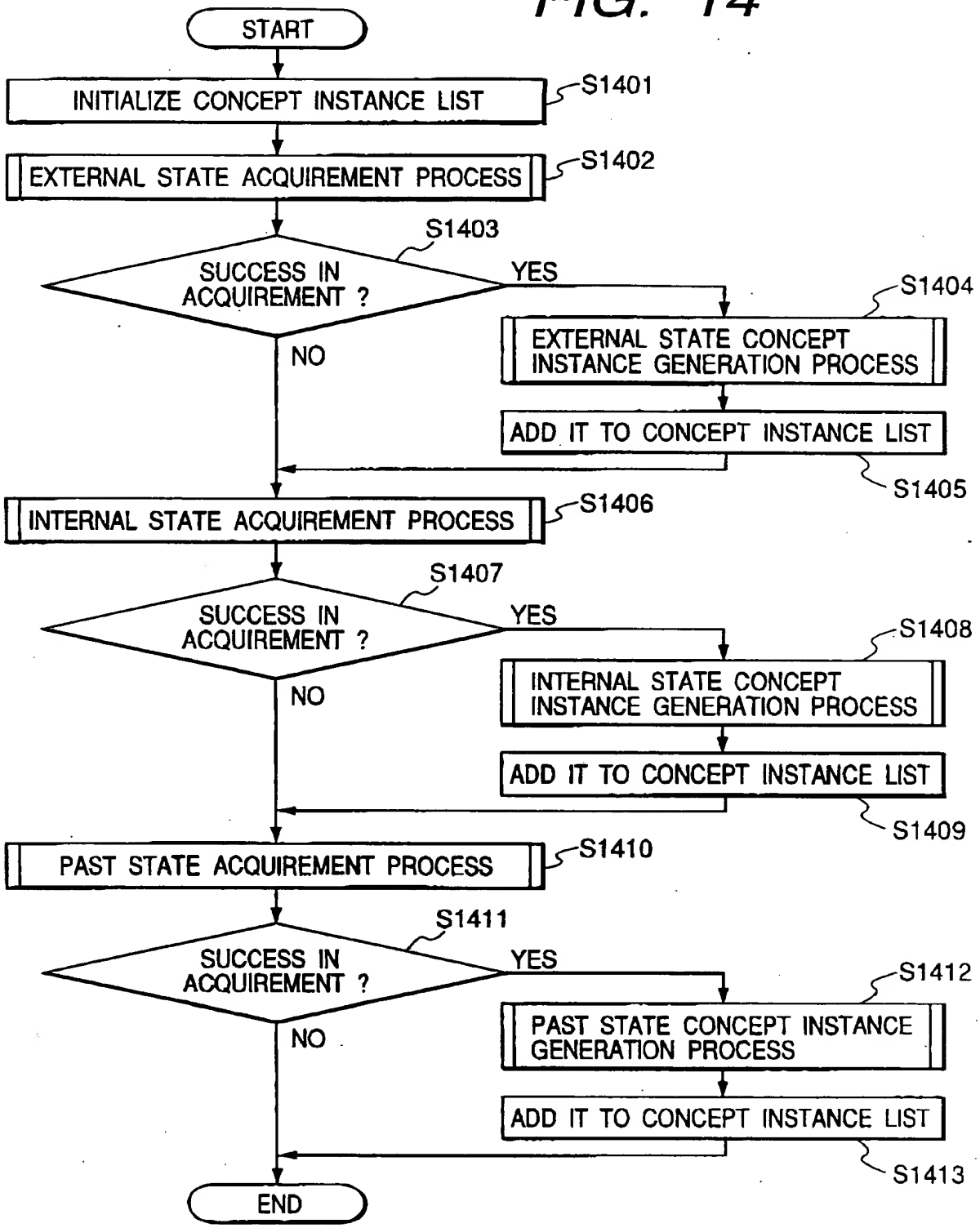

START
INITIALIZE CONCEPT INSTANCE LIST
S1401
EXTERNAL STATE ACQUIREMENT PROCESS
S1402
S1403
SUCCESS IN ACQUIREMENT ?
YES
NO
S1404
EXTERNAL STATE CONCEPT INSTANCE GENERATION PROCESS
ADD IT TO CONCEPT INSTANCE LIST
S1405
INTERNAL STATE ACQUIREMENT PROCESS
S1406
S1407
SUCCESS IN ACQUIREMENT ?
YES
NO
S1408
INTERNAL STATE CONCEPT INSTANCE GENERATION PROCESS
ADD IT TO CONCEPT INSTANCE LIST
S1409
PAST STATE ACQUIREMENT PROCESS
S1410
S1411
SUCCESS IN ACQUIREMENT ?
YES
NO
S1412
PAST STATE CONCEPT INSTANCE GENERATION PROCESS
ADD IT TO CONCEPT INSTANCE LIST
S1413
END

FIG. 15

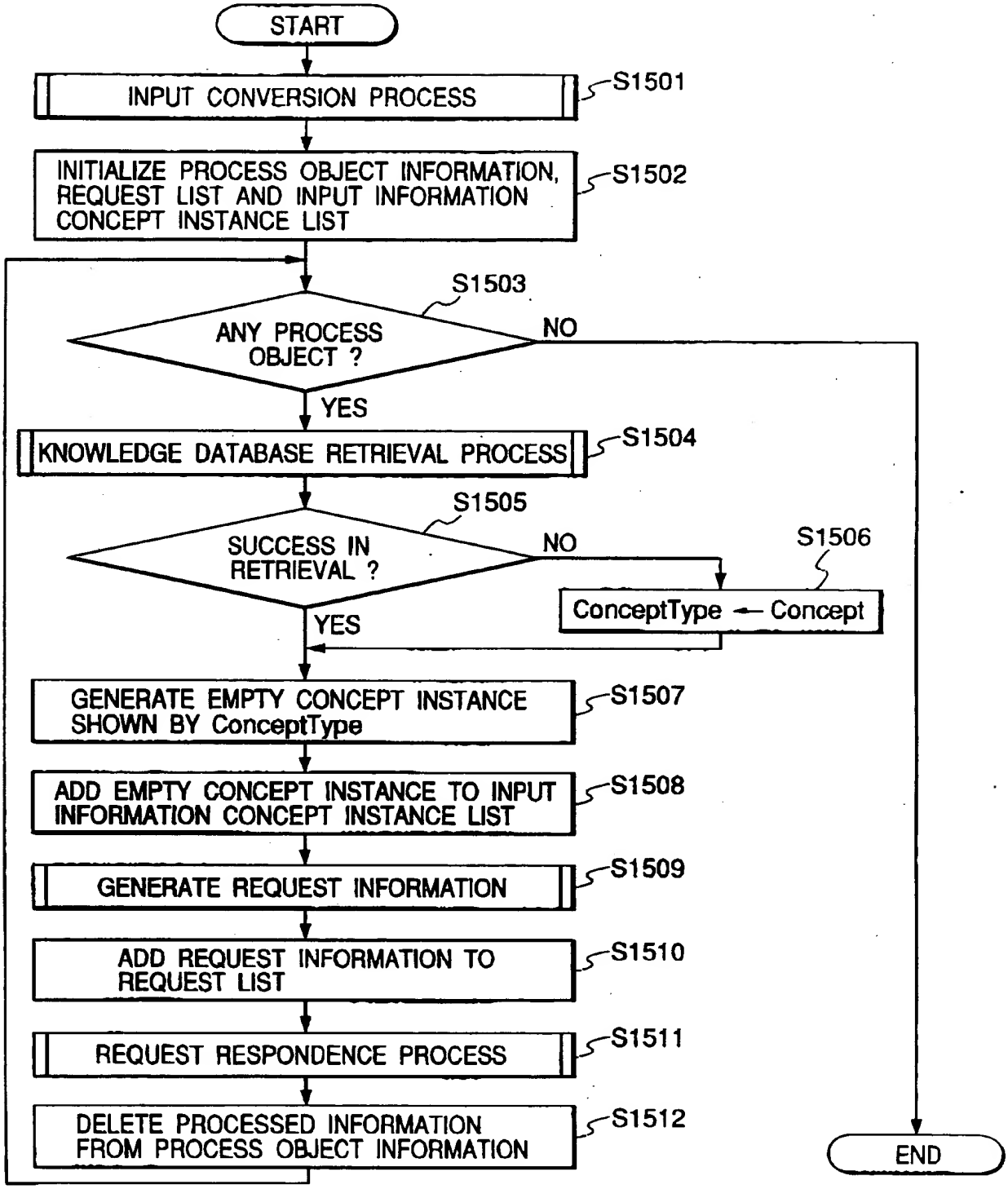

START
INPUT CONVERSION PROCESS
S1501
INITIALIZE PROCESS OBJECT INFORMATION, REQUEST LIST AND INPUT INFORMATION CONCEPT INSTANCE LIST
S1502
S1503
ANY PROCESS OBJECT ?
NO
YES
KNOWLEDGE DATABASE RETRIEVAL PROCESS
S1504
S1505
SUCCESS IN RETRIEVAL ?
NO
S1506
ConceptType ← Concept
YES
GENERATE EMPTY CONCEPT INSTANCE SHOWN BY ConceptType
S1507
ADD EMPTY CONCEPT INSTANCE TO INPUT INFORMATION CONCEPT INSTANCE LIST
S1508
GENERATE REQUEST INFORMATION
S1509
ADD REQUEST INFORMATION TO REQUEST LIST
S1510
REQUEST RESPONDENCE PROCESS
S1511
DELETE PROCESSED INFORMATION FROM PROCESS OBJECT INFORMATION
S1512
END

FIG. 16

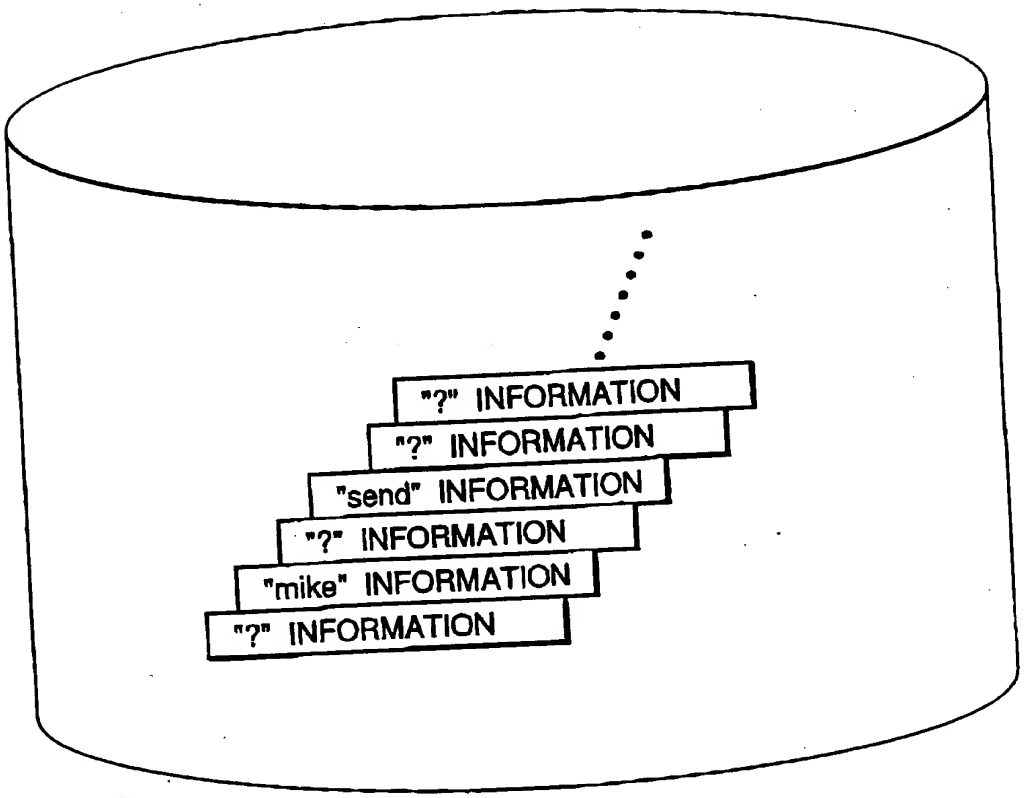


FIG. 18

CONCEPT "Person" DEFINITION

SLOT TYPE	INSTANCE APPLICATION RULE	INSTANCE REQUEST RULE
ConceptType	Person	Person
FirstName	CHARACTER STRING	CHARACTER STRING
MiddleName	CHARACTER STRING	CHARACTER STRING
LastName	CHARACTER STRING	CHARACTER STRING
Sex	male or female	male or female
Age	NUMERICAL VALUE	NUMERICAL VALUE
BelongsTo	List of <Organization>	List of <Organization>

FIG. 17

"send" INFORMATION

ITEM	CONTENTS
SURFACE LAYER CHARACTER STRING	"send"
ConceptType	Send
CONCEPT INSTANCE REQUEST RULE	STORE CONCEPT INSTANCE OF List of <Person> IN Actor
	STORE CONCEPT INSTANCE OF List of <Object> IN Object
	STORE CONCEPT INSTANCE STORED IN Actor IN From
	STORE CONCEPT INSTANCE OF List of <Person> or <Space> IN To
SURFACE LAYER REQUEST RULE	ARRANGE IN WORD ORDER OF "send" [Object] "to" [To]
	ARRANGE IN WORD ORDER OF "send" [To] [Object]
	ARRANGE IN WORD ORDER OF "send" "to" [To]
	ABIDE BY RULE OF "VERB" OF ENGLISH GRAMMAR
	ABIDE BY RULE OF PRESENT TENSE OF ENGLISH GRAMMAR

FIG. 19

"mike" INFORMATION

ITEM	CONTENTS
SURFACE LAYER CHARACTER STRING	"mike"
ConceptType	Person
CONCEPT INSTANCE REQUEST RULE	STORE "mike" IN FirstName
	STORE CHARACTER STRING IN MiddleName
	STORE CHARACTER STRING IN LastName
	STORE male IN Sex
	STORE NUMERICAL VALUE IN Age
	STORE CONCEPT INSTANCE OF List of <Organization> IN BelongsTo
SURFACE LAYER REQUEST RULE	ABIDE BY WORD ORDER OF "mike" [MiddleName] [LastName]
	ABIDE BY WORD ORDER OF "mike" [Sex] or [Age] or [BelongsTo]
	ABIDE BY RULE OF "NOUN" OF ENGLISH GRAMMAR

FIG. 20

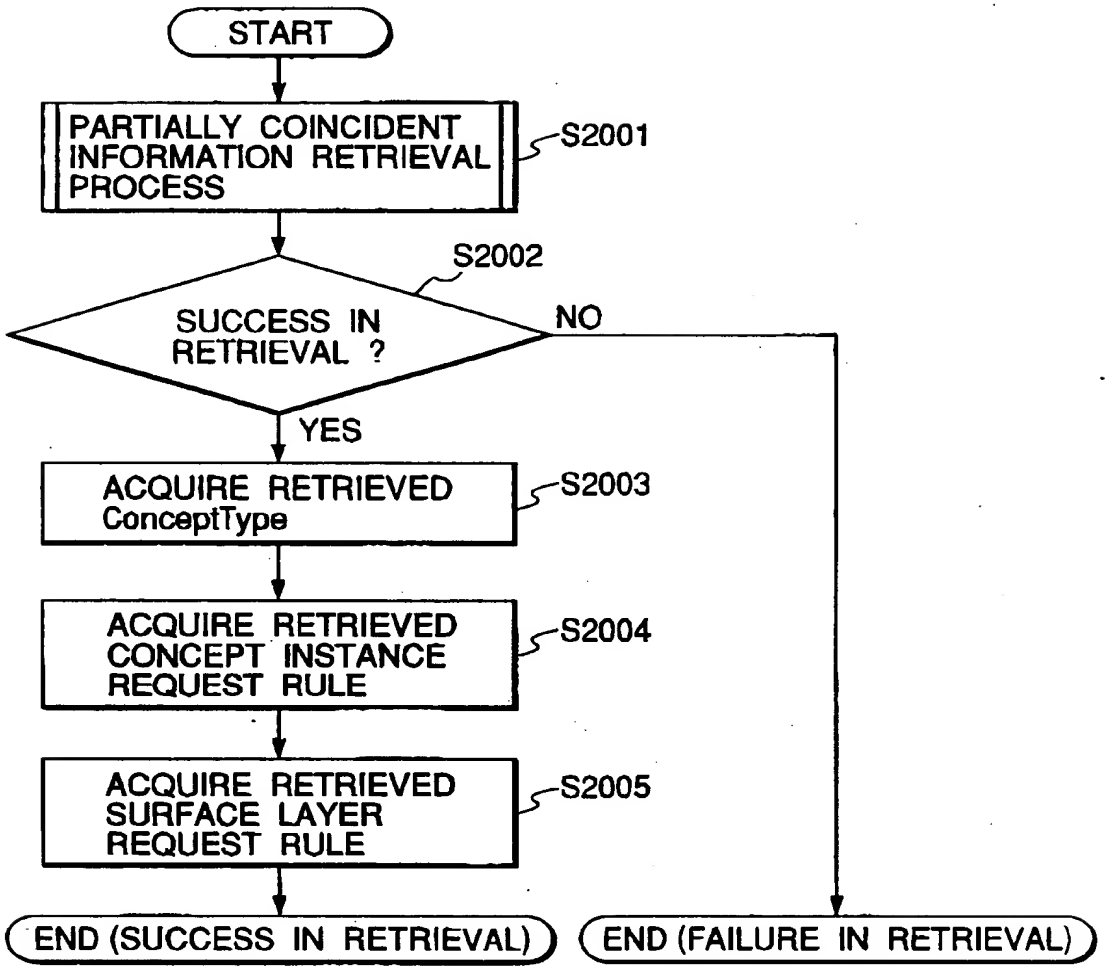

START
PARTIALLY COINCIDENT INFORMATION RETRIEVAL PROCESS
S2001
S2002
SUCCESS IN RETRIEVAL ?
NO
YES
ACQUIRE RETRIEVED ConceptType
S2003
ACQUIRE RETRIEVED CONCEPT INSTANCE REQUEST RULE
S2004
ACQUIRE RETRIEVED SURFACE LAYER REQUEST RULE
S2005
END (SUCCESS IN RETRIEVAL)
END (FAILURE IN RETRIEVAL)

FIG. 21

FIG. 22

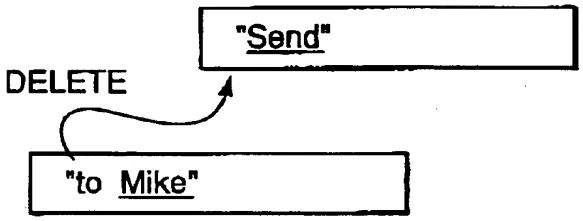


FIG. 23

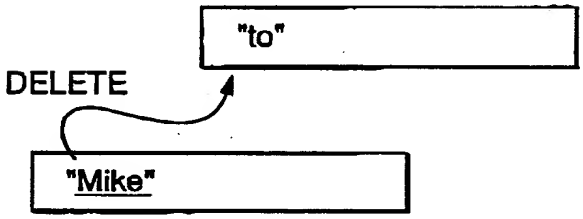


FIG. 24

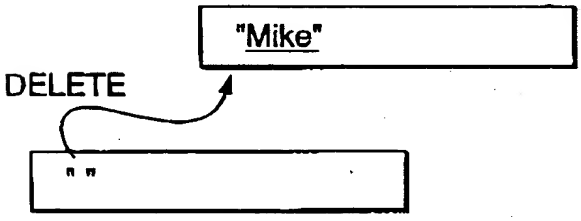


FIG. 25

INPUT INFORMATION CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	"Send"	CONCEPT 1

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	Send

FIG. 26

INPUT INFORMATION CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	"Send"	CONCEPT 1
2	"to"	CONCEPT 2

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	Send

CONCEPT INSTANCE 2

SLOT TYPE	INSTANCE
ConceptType	Concept

FIG. 27

INPUT INFORMATION CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	"Send"	CONCEPT 1
2	"to"	CONCEPT 2
3	"Mike"	CONCEPT 3

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	Send

CONCEPT INSTANCE 2

SLOT TYPE	INSTANCE
ConceptType	Concept

CONCEPT INSTANCE 3

SLOT TYPE	INSTANCE
ConceptType	Person

FIG. 28

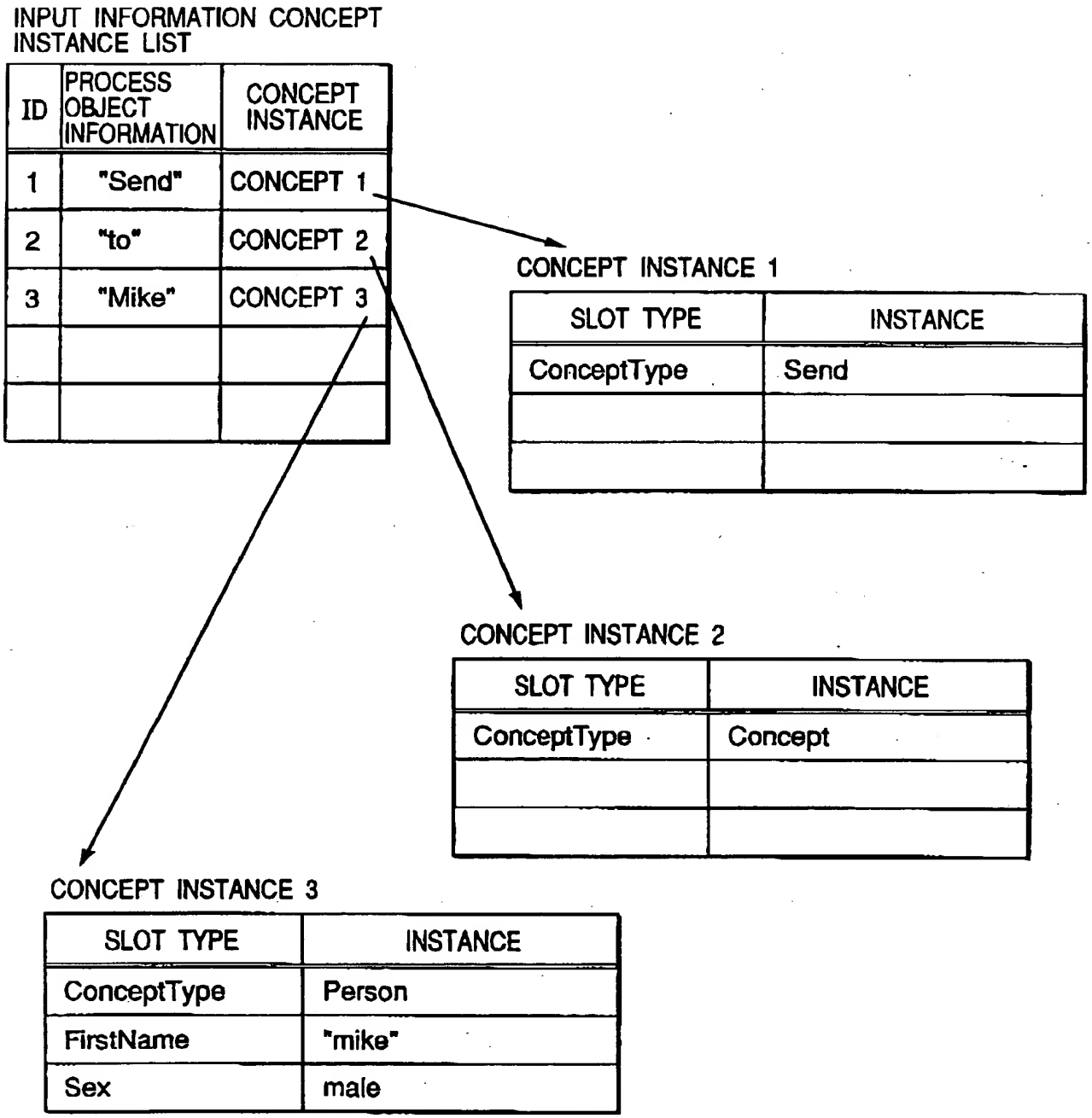

INPUT INFORMATION CONCEPT INSTANCE LIST
ID
PROCESS OBJECT INFORMATION
CONCEPT INSTANCE
1
"Send"
CONCEPT 1
2
"to"
CONCEPT 2
3
"Mike"
CONCEPT 3
CONCEPT INSTANCE 1
SLOT TYPE
INSTANCE
ConceptType
Send
CONCEPT INSTANCE 2
SLOT TYPE
INSTANCE
ConceptType
Concept
CONCEPT INSTANCE 3
SLOT TYPE
INSTANCE
ConceptType
Person
FirstName
"mike"
Sex
male

FIG. 29

INPUT INFORMATION CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	"Send"	CONCEPT 1

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	Send
To	CONCEPT 3

CONCEPT INSTANCE 3

SLOT TYPE	INSTANCE
ConceptType	Person
FirstName	"mike"
Sex	male

FIG. 30

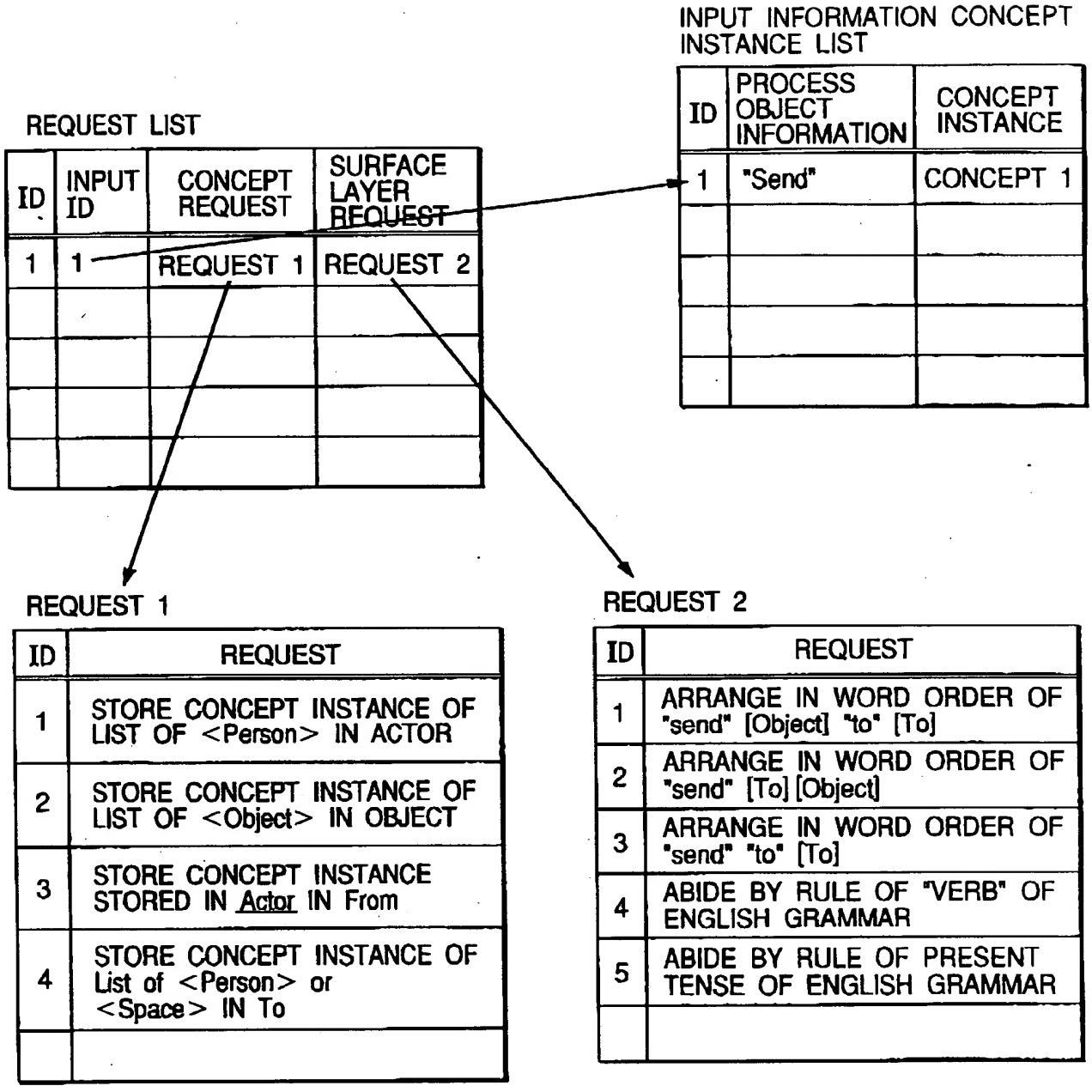

INPUT INFORMATION CONCEPT INSTANCE LIST
ID
PROCESS OBJECT INFORMATION
CONCEPT INSTANCE
1
"Send"
CONCEPT 1
REQUEST LIST
ID
INPUT ID
CONCEPT REQUEST
SURFACE LAYER REQUEST
1
1
REQUEST 1
REQUEST 2
REQUEST 1
ID
REQUEST
1
STORE CONCEPT INSTANCE OF LIST OF <Person> IN ACTOR
2
STORE CONCEPT INSTANCE OF LIST OF <Object> IN OBJECT
3
STORE CONCEPT INSTANCE STORED IN Actor IN From
4
STORE CONCEPT INSTANCE OF List of <Person> or <Space> IN To
REQUEST 2
ID
REQUEST
1
ARRANGE IN WORD ORDER OF "send" [Object] "to" [To]
2
ARRANGE IN WORD ORDER OF "send" [To] [Object]
3
ARRANGE IN WORD ORDER OF "send" "to" [To]
4
ABIDE BY RULE OF "VERB" OF ENGLISH GRAMMAR
5
ABIDE BY RULE OF PRESENT TENSE OF ENGLISH GRAMMAR

FIG. 31

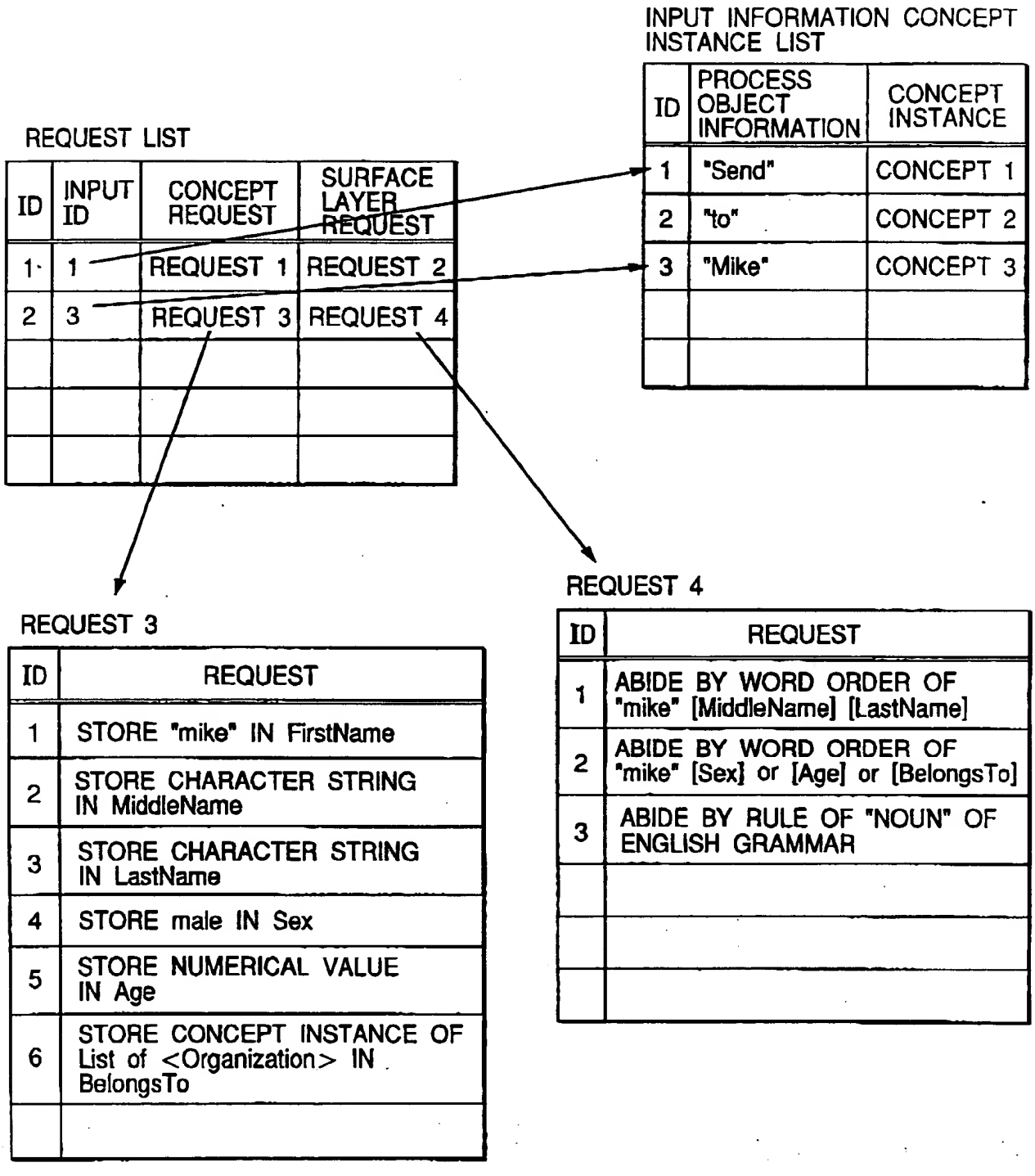

INPUT INFORMATION CONCEPT INSTANCE LIST
ID
PROCESS OBJECT INFORMATION
CONCEPT INSTANCE
1 "Send" CONCEPT 1
2 "to" CONCEPT 2
3 "Mike" CONCEPT 3
REQUEST LIST
ID
INPUT ID
CONCEPT REQUEST
SURFACE LAYER REQUEST
1 1 REQUEST 1 REQUEST 2
2 3 REQUEST 3 REQUEST 4
REQUEST 3
ID
REQUEST
1 STORE "mike" IN FirstName
2 STORE CHARACTER STRING IN MiddleName
3 STORE CHARACTER STRING IN LastName
4 STORE male IN Sex
5 STORE NUMERICAL VALUE IN Age
6 STORE CONCEPT INSTANCE OF List of <Organization> IN BelongsTo
REQUEST 4
ID
REQUEST
1 ABIDE BY WORD ORDER OF "mike" [MiddleName] [LastName]
2 ABIDE BY WORD ORDER OF "mike" [Sex] or [Age] or [BelongsTo]
3 ABIDE BY RULE OF "NOUN" OF ENGLISH GRAMMAR

FIG. 32

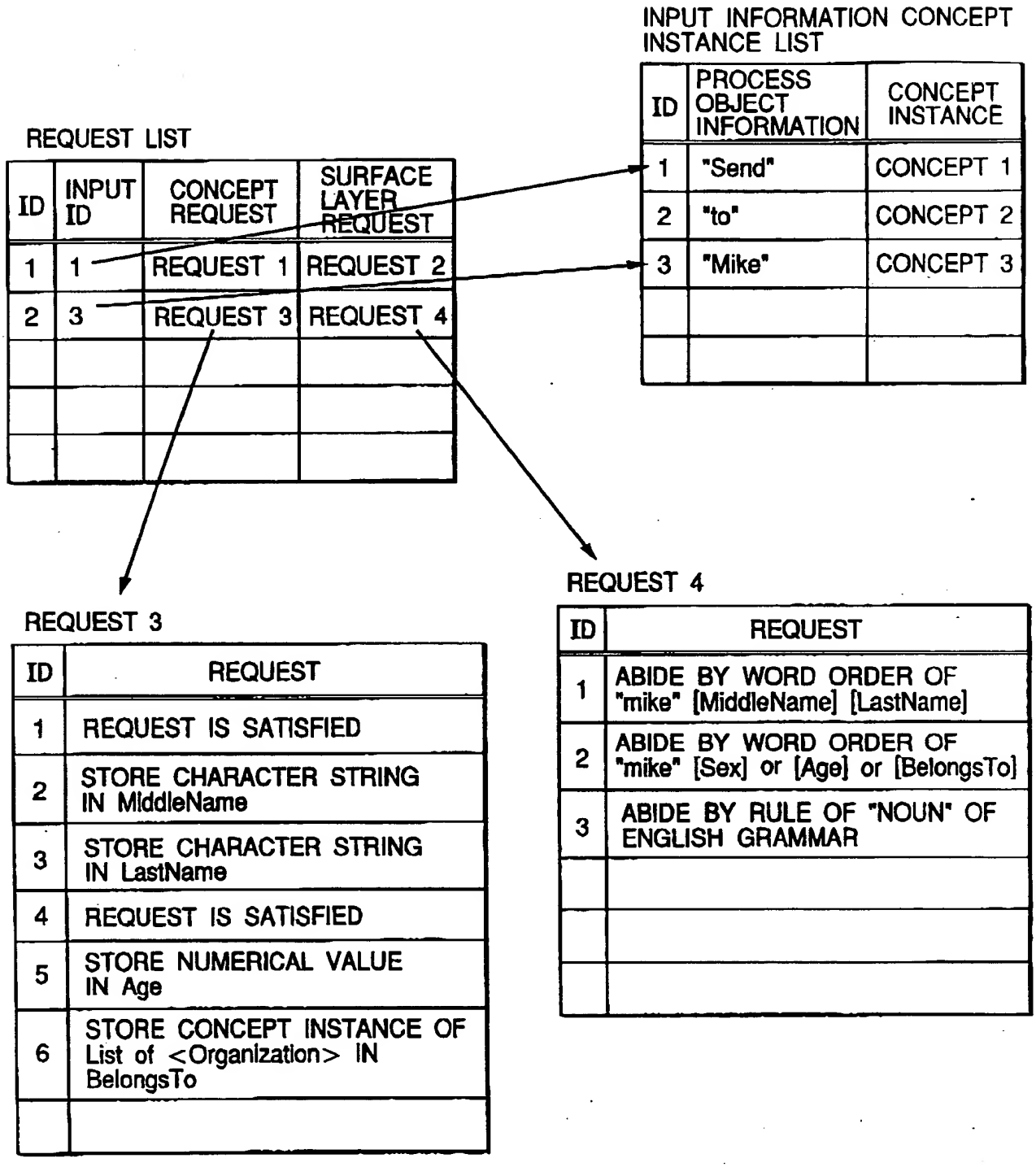

INPUT INFORMATION CONCEPT INSTANCE LIST
ID
PROCESS OBJECT INFORMATION
CONCEPT INSTANCE
1
"Send"
CONCEPT 1
2
"to"
CONCEPT 2
3
"Mike"
CONCEPT 3
REQUEST LIST
ID
INPUT ID
CONCEPT REQUEST
SURFACE LAYER REQUEST
1
1
REQUEST 1
REQUEST 2
2
3
REQUEST 3
REQUEST 4
REQUEST 3
ID
REQUEST
1
REQUEST IS SATISFIED
2
STORE CHARACTER STRING IN MiddleName
3
STORE CHARACTER STRING IN LastName
4
REQUEST IS SATISFIED
5
STORE NUMERICAL VALUE IN Age
6
STORE CONCEPT INSTANCE OF List of <Organization> IN BelongsTo
REQUEST 4
ID
REQUEST
1
ABIDE BY WORD ORDER OF "mike" [MiddleName] [LastName]
2
ABIDE BY WORD ORDER OF "mike" [Sex] or [Age] or [BelongsTo]
3
ABIDE BY RULE OF "NOUN" OF ENGLISH GRAMMAR

FIG. 33

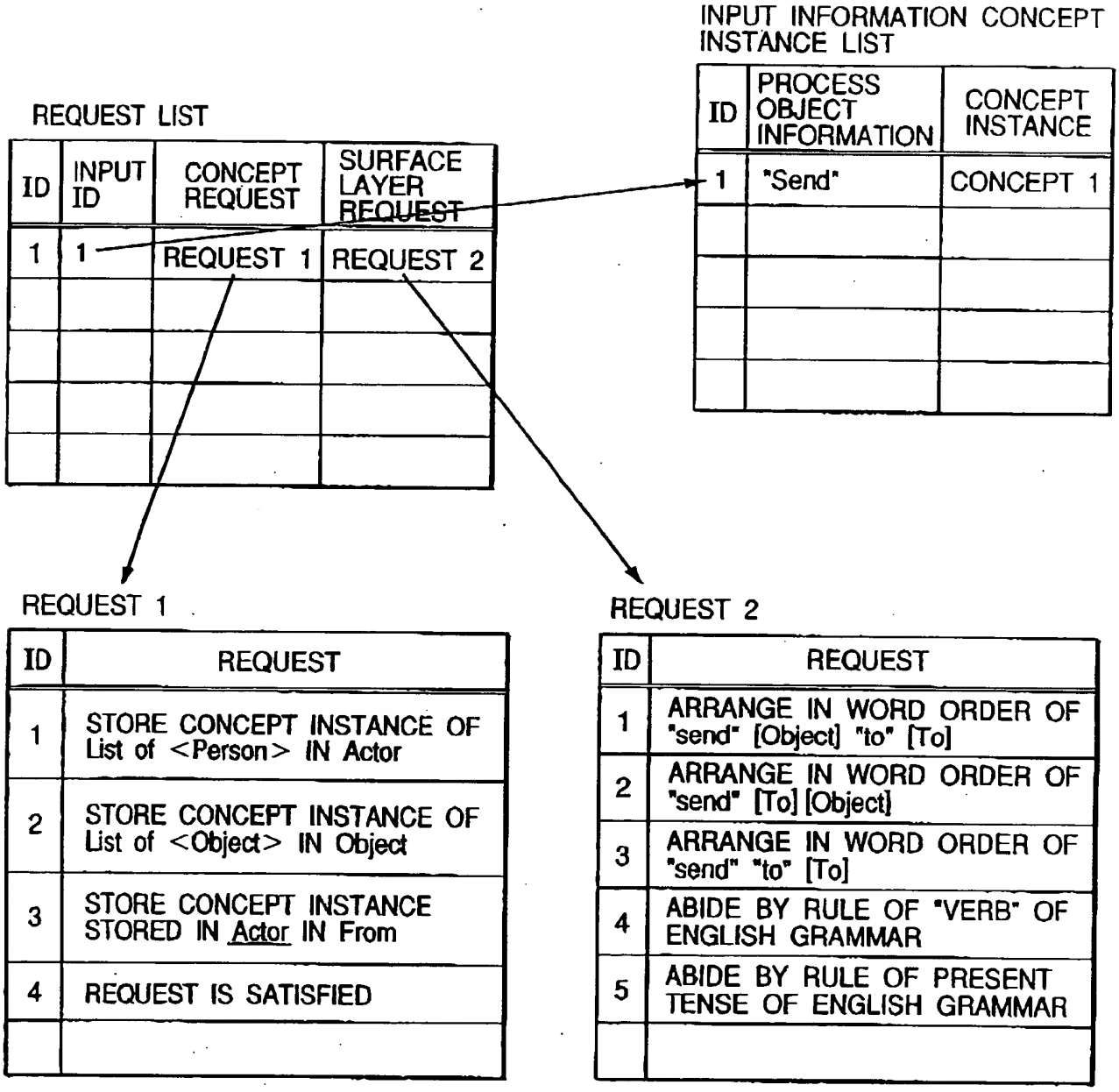

INPUT INFORMATION CONCEPT INSTANCE LIST
ID
PROCESS OBJECT INFORMATION
CONCEPT INSTANCE
1
"Send"
CONCEPT 1
REQUEST LIST
ID
INPUT ID
CONCEPT REQUEST
SURFACE LAYER REQUEST
1
1
REQUEST 1
REQUEST 2
REQUEST 1
ID
REQUEST
1
STORE CONCEPT INSTANCE OF List of <Person> IN Actor
2
STORE CONCEPT INSTANCE OF List of <Object> IN Object
3
STORE CONCEPT INSTANCE STORED IN Actor IN From
4
REQUEST IS SATISFIED
REQUEST 2
ID
REQUEST
1
ARRANGE IN WORD ORDER OF "send" [Object] "to" [To]
2
ARRANGE IN WORD ORDER OF "send" [To] [Object]
3
ARRANGE IN WORD ORDER OF "send" "to" [To]
4
ABIDE BY RULE OF "VERB" OF ENGLISH GRAMMAR
5
ABIDE BY RULE OF PRESENT TENSE OF ENGLISH GRAMMAR

FIG. 34

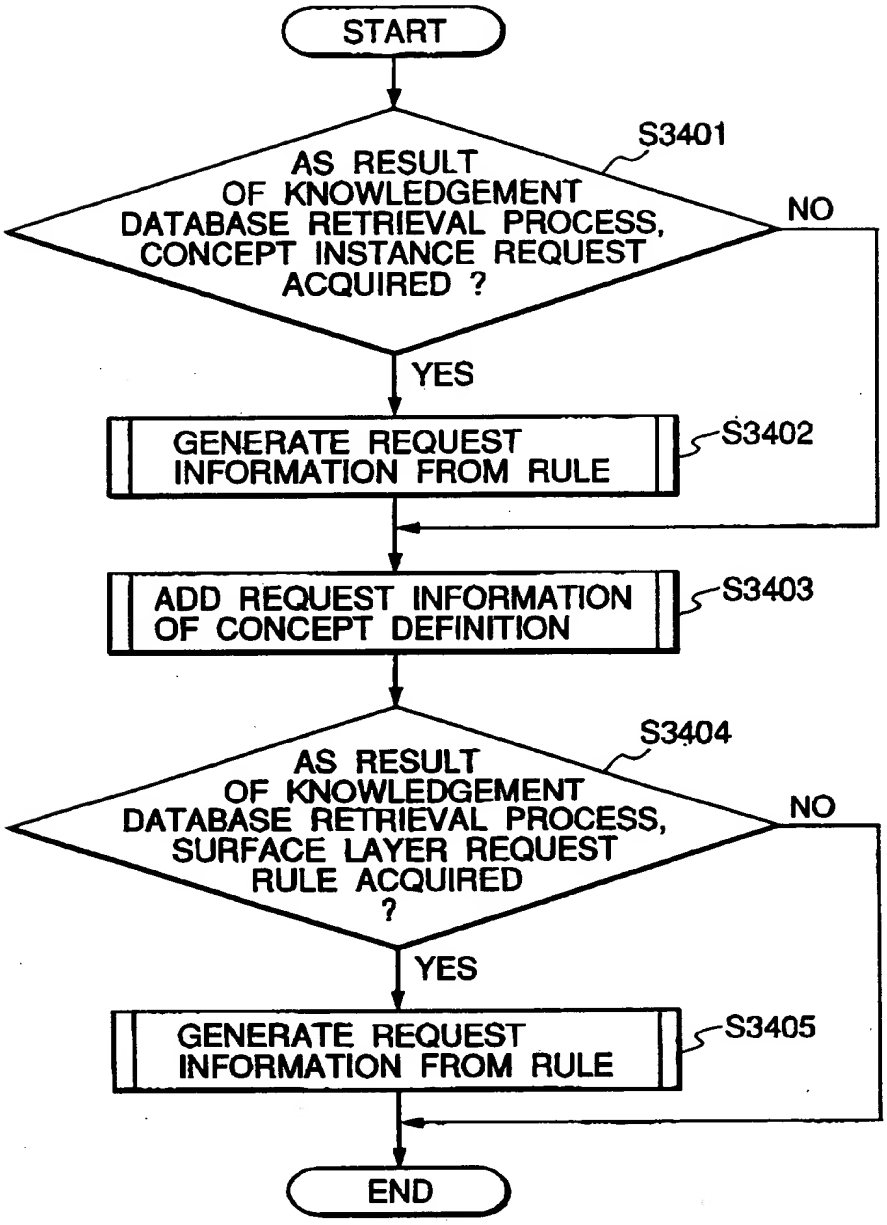

START
S3401
AS RESULT OF KNOWLEDGEMENT DATABASE RETRIEVAL PROCESS, CONCEPT INSTANCE REQUEST ACQUIRED ?
NO
YES
GENERATE REQUEST INFORMATION FROM RULE
S3402
ADD REQUEST INFORMATION OF CONCEPT DEFINITION
S3403
S3404
AS RESULT OF KNOWLEDGEMENT DATABASE RETRIEVAL PROCESS, SURFACE LAYER REQUEST RULE ACQUIRED ?
NO
YES
GENERATE REQUEST INFORMATION FROM RULE
S3405
END

FIG. 35

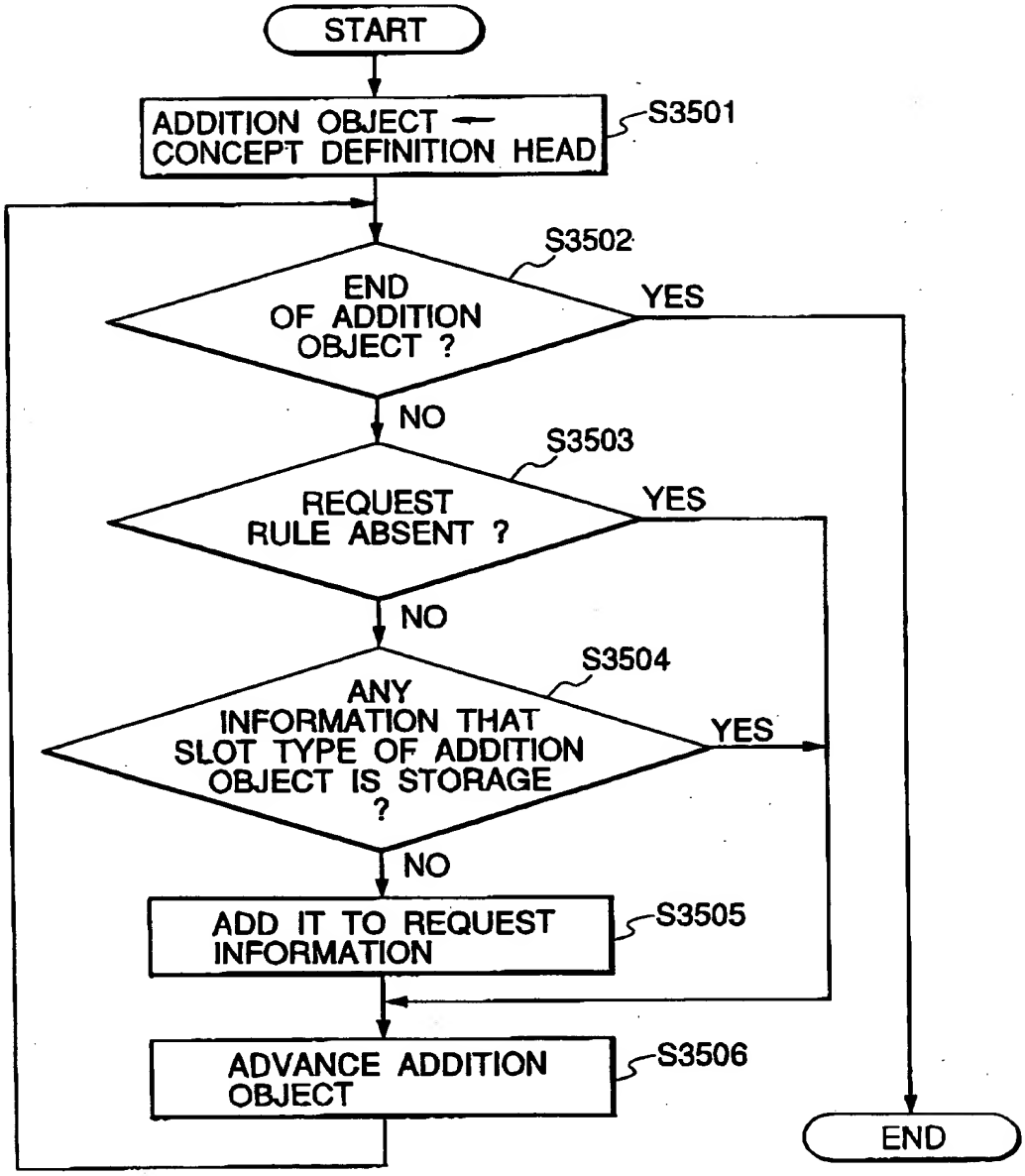

START
ADDITION OBJECT — CONCEPT DEFINITION HEAD
S3501
S3502
END OF ADDITION OBJECT ?
YES
NO
S3503
REQUEST RULE ABSENT ?
YES
NO
S3504
ANY INFORMATION THAT SLOT TYPE OF ADDITION OBJECT IS STORAGE ?
YES
NO
ADD IT TO REQUEST INFORMATION
S3505
ADVANCE ADDITION OBJECT
S3506
END

FIG. 36

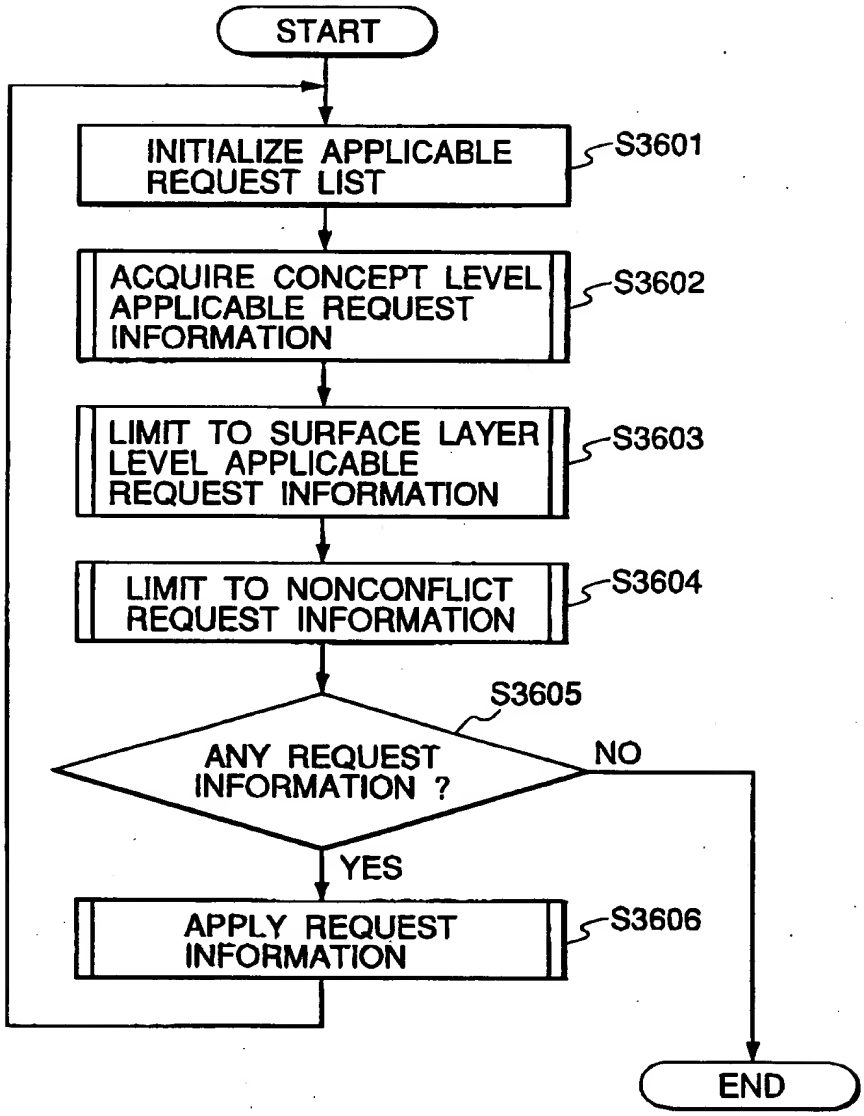

START
INITIALIZE APPLICABLE REQUEST LIST
S3601
ACQUIRE CONCEPT LEVEL APPLICABLE REQUEST INFORMATION
S3602
LIMIT TO SURFACE LAYER LEVEL APPLICABLE REQUEST INFORMATION
S3603
LIMIT TO NONCONFLICT REQUEST INFORMATION
S3604
S3605
ANY REQUEST INFORMATION ?
NO
YES
APPLY REQUEST INFORMATION
S3606
END

FIG. 37

APPLICABLE REQUEST LIST

ID	APPLICABLE REQUEST INFORMATION	INSTANCE	ORIGINAL REQUEST INFORMATION	ORIGINAL REQUEST ID
1	STORE CONCEPT INSTANCE OF List of <Person> IN Actor	CONCEPT 3	1	1
2	STORE CONCEPT INSTANCE OF List of <Object> IN Object	CONCEPT 3	1	2
3	STORE CONCEPT INSTANCE OF List of <Person> or <Space> IN To	CONCEPT 3	1	4
4	STORE "Mike" IN FirstName	NONE	3	1
5	STORE CHARACTER STRING IN MiddleName	CONCEPT 1	3	2
6	STORE CHARACTER STRING IN MiddleName	CONCEPT 2	3	2
7	STORE CHARACTER STRING IN LastName	CONCEPT 1	3	3
8	STORE CHARACTER STRING IN LastName	CONCEPT 2	3	3
9	STORE Male IN Sex	NONE	3	4

FIG. 38

APPLICABLE REQUEST LIST

ID	APPLICABLE REQUEST INFORMATION	INSTANCE	ORIGINAL REQUEST INFORMATION	ORIGINAL REQUEST ID
1	STORE CONCEPT INSTANCE OF List of <Person> IN Actor	CONCEPT 3	1	1
2	STORE CONCEPT INSTANCE OF List of <Object> IN Object	CONCEPT 3	1	2
3	STORE CONCEPT INSTANCE OF List of <Person> or <Space> IN To	CONCEPT 3	1	4
4	STORE CHARACTER STRING IN MiddleName	CONCEPT 1	3	2
5	STORE CHARACTER STRING IN MiddleName	CONCEPT 2	3	2
6	STORE CHARACTER STRING IN LastName	CONCEPT 1	3	3
7	STORE CHARACTER STRING IN LastName	CONCEPT 2	3	3

FIG. 39

APPLICABLE REQUEST LIST

ID	APPLICABLE REQUEST INFORMATION	INSTANCE	ORIGINAL REQUEST INFORMATION	ORIGINAL REQUEST ID
1	STORE "Mike" IN FirstName	NONE	3	1
2	STORE Male IN Sex	NONE	3	4

FIG. 40

APPLICABLE REQUEST LIST

ID	APPLICABLE REQUEST INFORMATION	INSTANCE	ORIGINAL REQUEST INFORMATION	ORIGINAL REQUEST ID
1	STORE CONCEPT INSTANCE OF List of <Person> or <Space> IN To	CONCEPT 3	1	4

FIG. 41

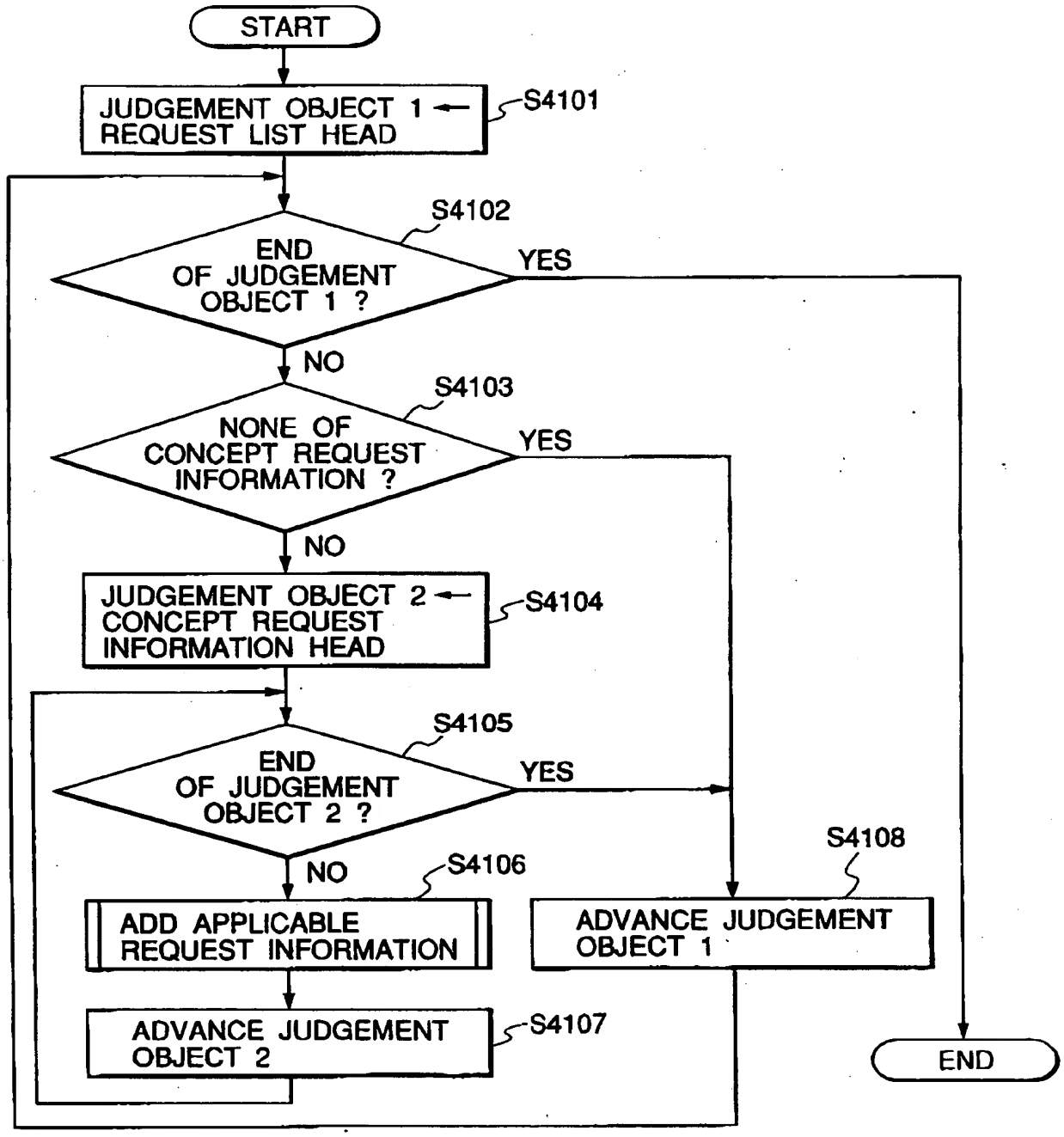

START
JUDGEMENT OBJECT 1 ← REQUEST LIST HEAD
S4101
S4102
END OF JUDGEMENT OBJECT 1 ?
YES
NO
S4103
NONE OF CONCEPT REQUEST INFORMATION ?
YES
NO
JUDGEMENT OBJECT 2 ← CONCEPT REQUEST INFORMATION HEAD
S4104
S4105
END OF JUDGEMENT OBJECT 2 ?
YES
NO
S4106
ADD APPLICABLE REQUEST INFORMATION
ADVANCE JUDGEMENT OBJECT 2
S4107
S4108
ADVANCE JUDGEMENT OBJECT 1
END

FIG. 42

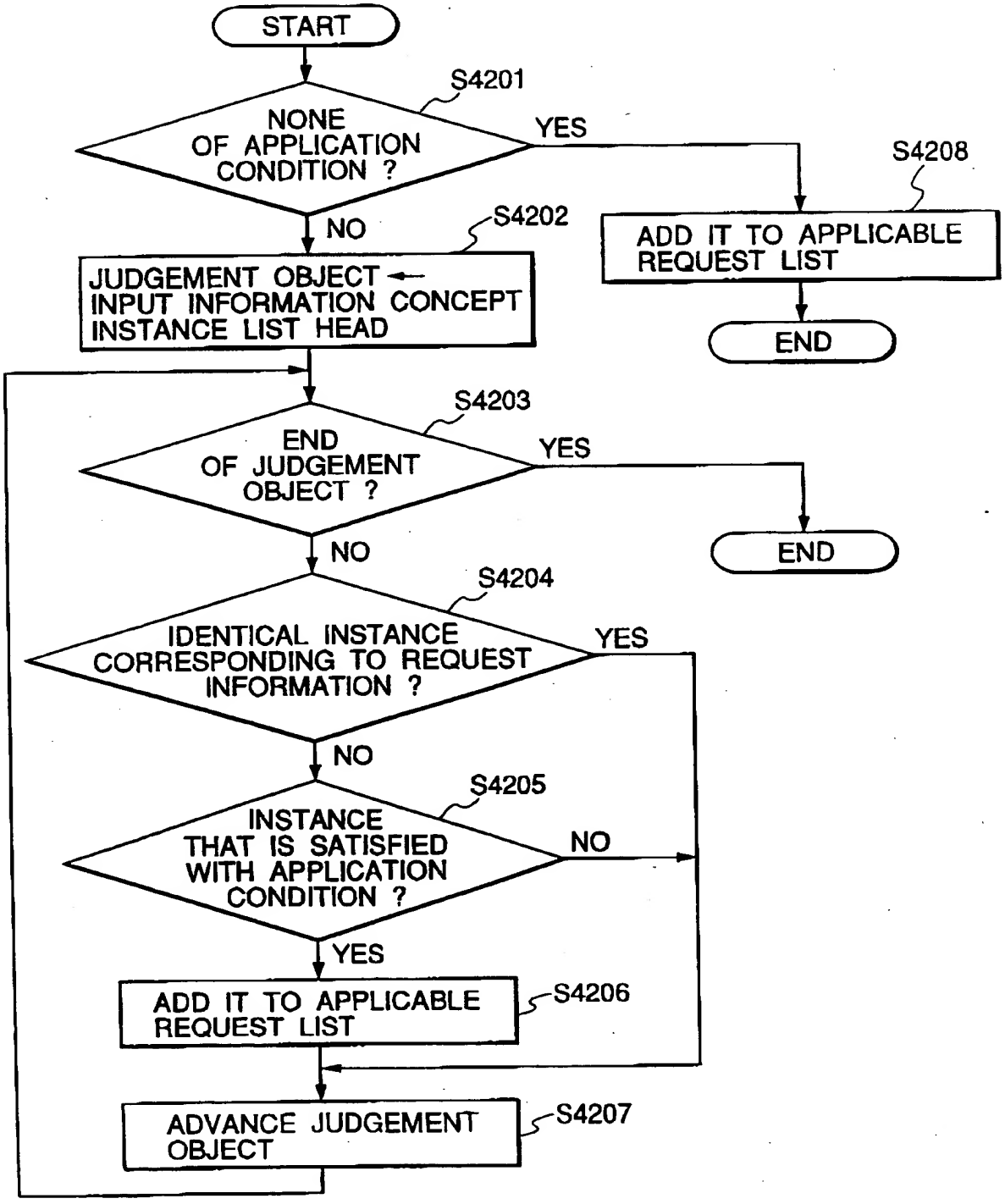

START
S4201
NONE OF APPLICATION CONDITION ?
YES
S4208
ADD IT TO APPLICABLE REQUEST LIST
END
NO
S4202
JUDGEMENT OBJECT ← INPUT INFORMATION CONCEPT INSTANCE LIST HEAD
S4203
END OF JUDGEMENT OBJECT ?
YES
END
NO
S4204
IDENTICAL INSTANCE CORRESPONDING TO REQUEST INFORMATION ?
YES
NO
S4205
INSTANCE THAT IS SATISFIED WITH APPLICATION CONDITION ?
NO
YES
ADD IT TO APPLICABLE REQUEST LIST
S4206
ADVANCE JUDGEMENT OBJECT
S4207

FIG. 43

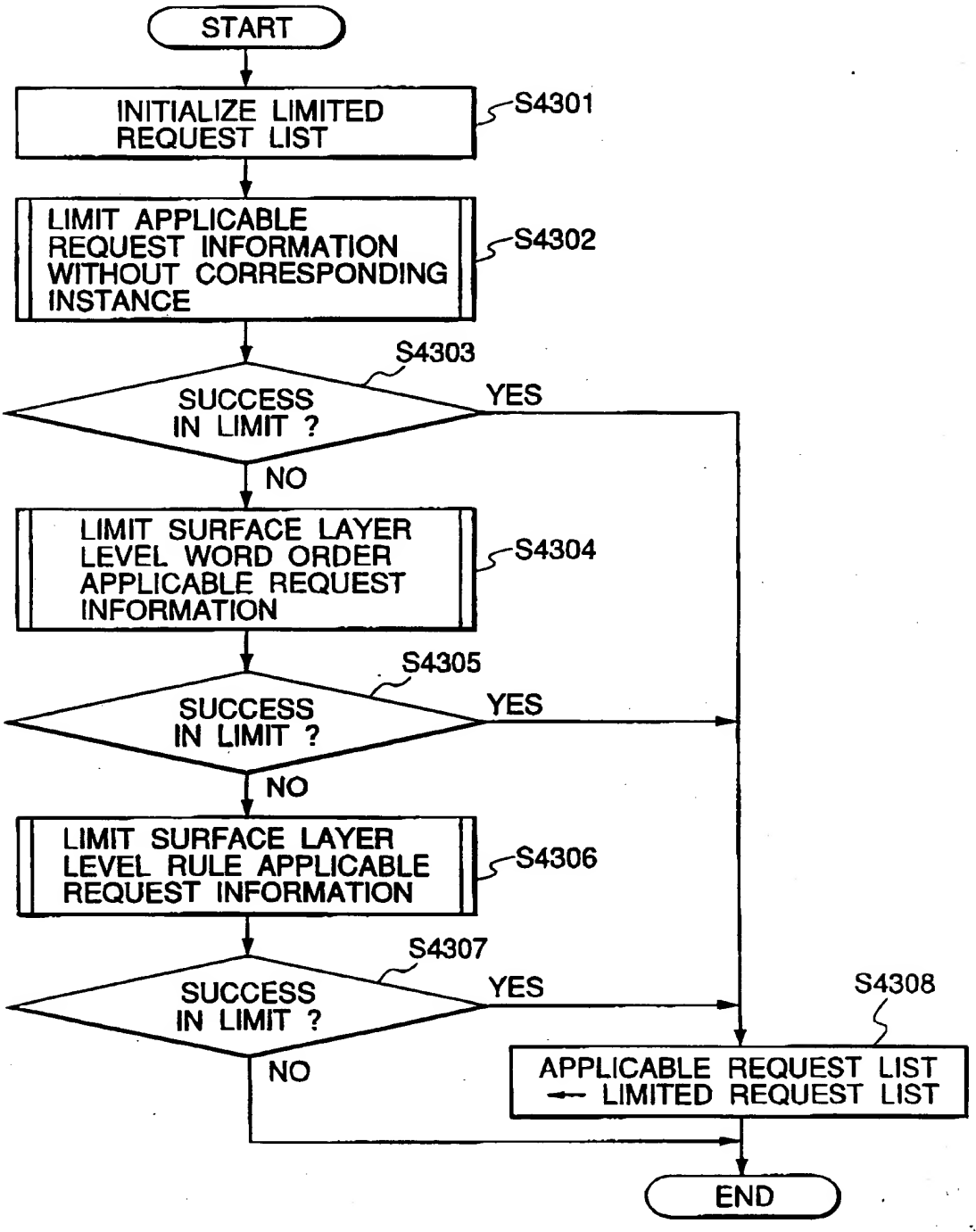

START
INITIALIZE LIMITED REQUEST LIST
S4301
LIMIT APPLICABLE REQUEST INFORMATION WITHOUT CORRESPONDING INSTANCE
S4302
S4303
SUCCESS IN LIMIT ?
YES
NO
LIMIT SURFACE LAYER LEVEL WORD ORDER APPLICABLE REQUEST INFORMATION
S4304
S4305
SUCCESS IN LIMIT ?
YES
NO
LIMIT SURFACE LAYER LEVEL RULE APPLICABLE REQUEST INFORMATION
S4306
S4307
SUCCESS IN LIMIT ?
YES
NO
S4308
APPLICABLE REQUEST LIST ← LIMITED REQUEST LIST
END

FIG. 44

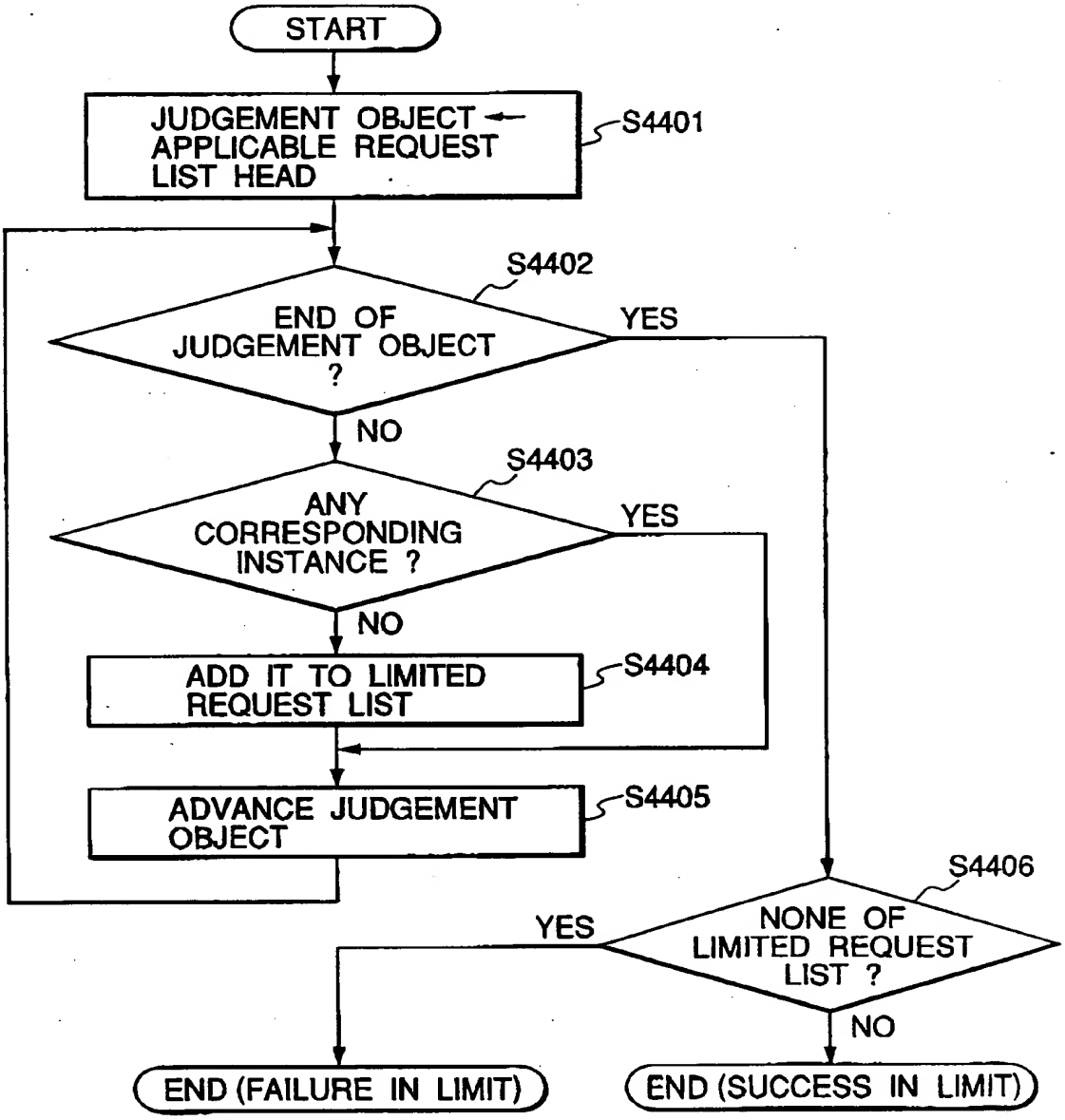

START
JUDGEMENT OBJECT ← APPLICABLE REQUEST LIST HEAD
S4401
S4402
END OF JUDGEMENT OBJECT ?
YES
NO
S4403
ANY CORRESPONDING INSTANCE ?
YES
NO
ADD IT TO LIMITED REQUEST LIST
S4404
ADVANCE JUDGEMENT OBJECT
S4405
S4406
NONE OF LIMITED REQUEST LIST ?
YES
NO
END (FAILURE IN LIMIT)
END (SUCCESS IN LIMIT)

FIG. 45

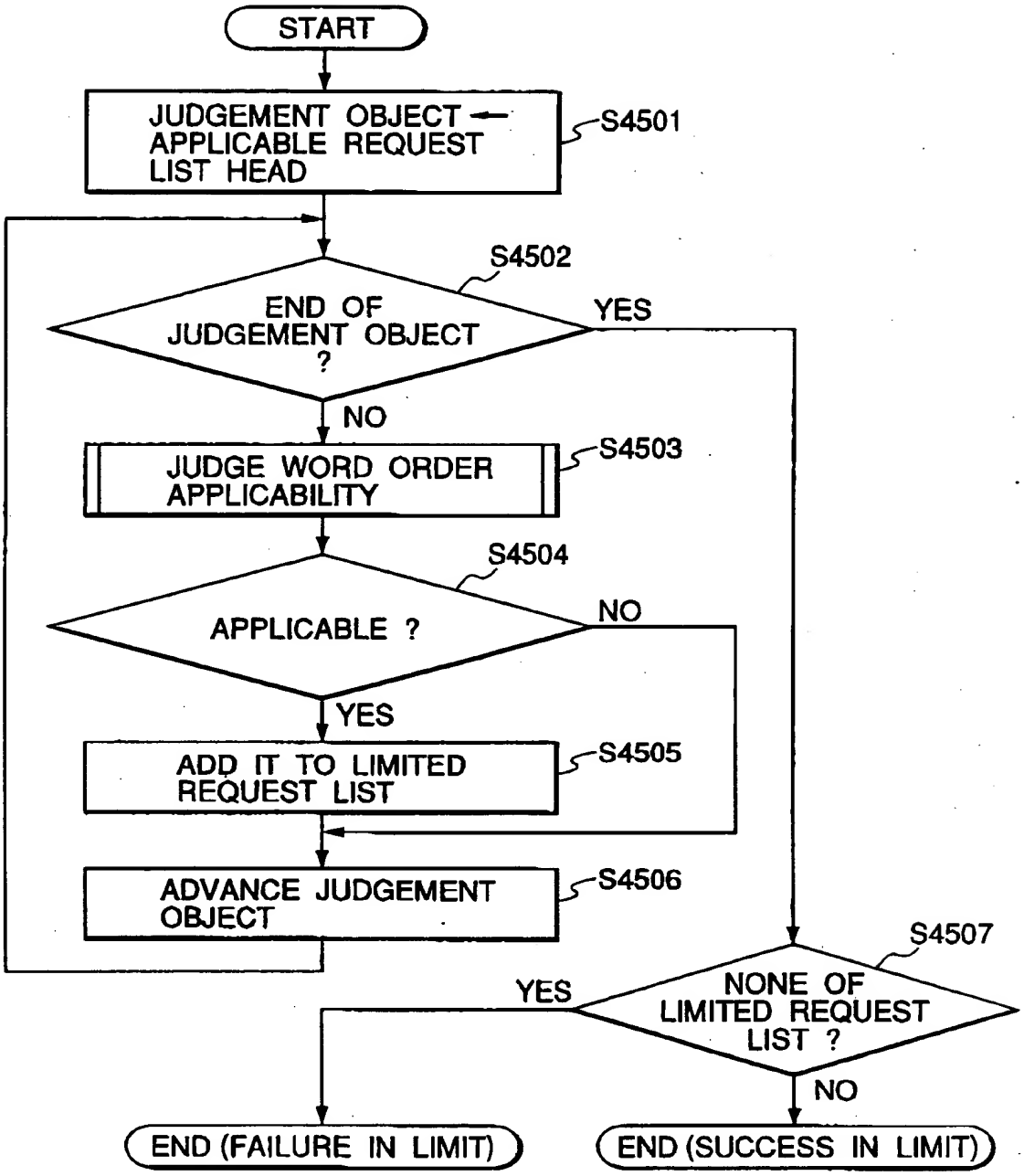

START
JUDGEMENT OBJECT ← APPLICABLE REQUEST LIST HEAD
S4501
S4502
END OF JUDGEMENT OBJECT ?
YES
NO
JUDGE WORD ORDER APPLICABILITY
S4503
S4504
APPLICABLE ?
NO
YES
ADD IT TO LIMITED REQUEST LIST
S4505
ADVANCE JUDGEMENT OBJECT
S4506
S4507
NONE OF LIMITED REQUEST LIST ?
YES
NO
END (FAILURE IN LIMIT)
END (SUCCESS IN LIMIT)

FIG. 46

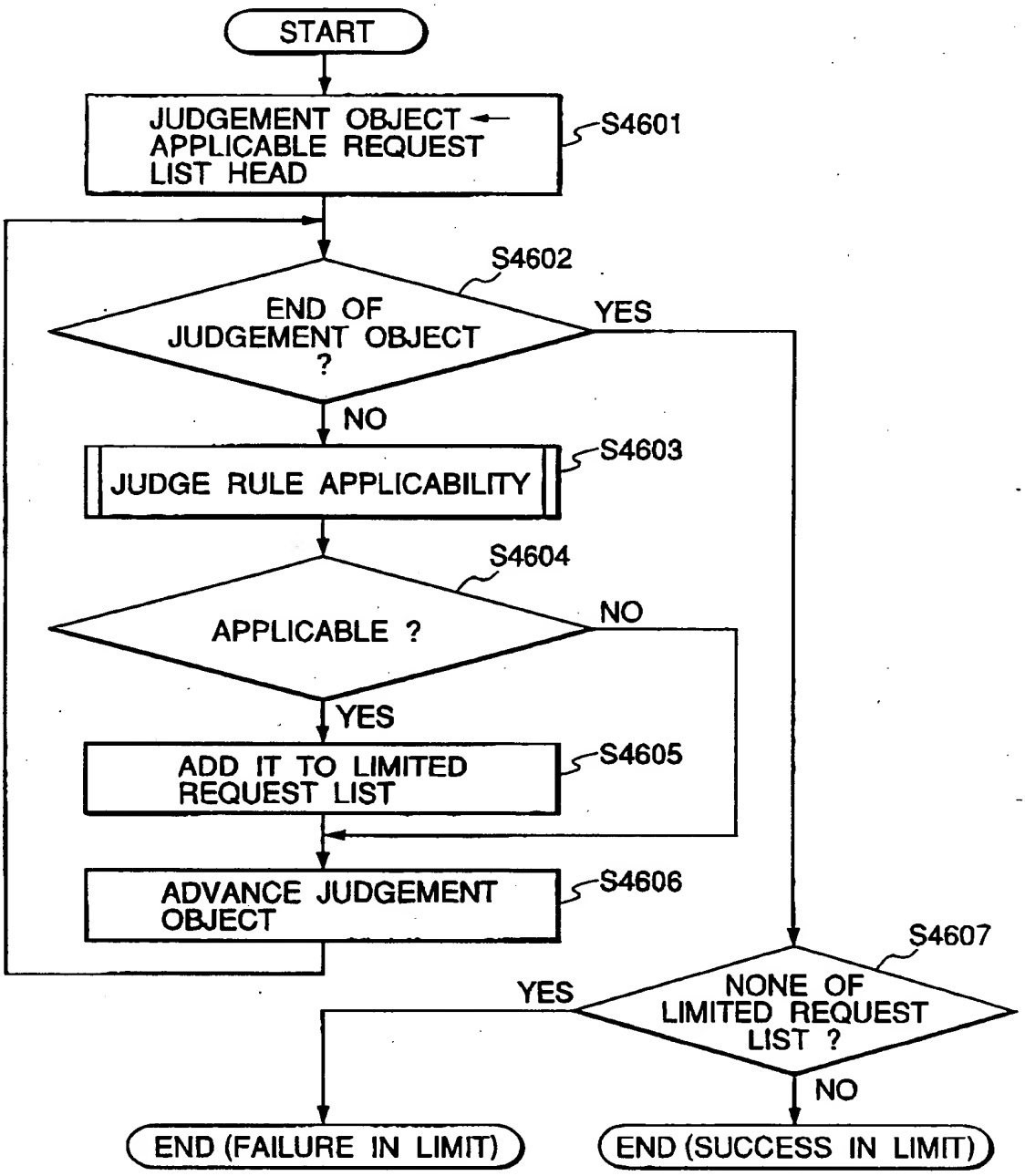

START
JUDGEMENT OBJECT ← APPLICABLE REQUEST LIST HEAD
S4601
S4602
END OF JUDGEMENT OBJECT ?
YES
NO
JUDGE RULE APPLICABILITY
S4603
S4604
APPLICABLE ?
NO
YES
ADD IT TO LIMITED REQUEST LIST
S4605
ADVANCE JUDGEMENT OBJECT
S4606
S4607
NONE OF LIMITED REQUEST LIST ?
YES
NO
END (FAILURE IN LIMIT)
END (SUCCESS IN LIMIT)

FIG. 47

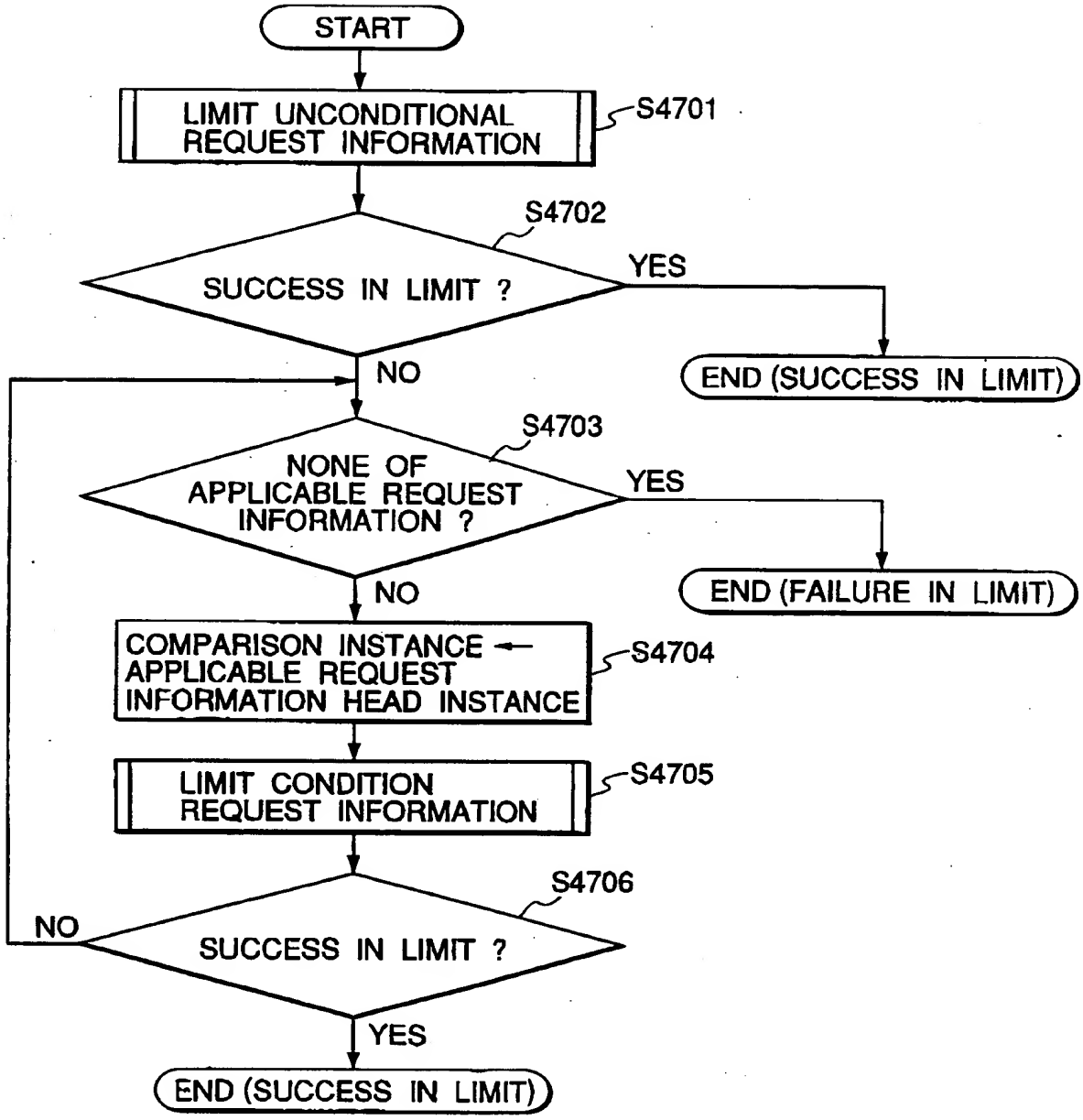

START
LIMIT UNCONDITIONAL REQUEST INFORMATION
S4701
S4702
SUCCESS IN LIMIT ?
YES
END (SUCCESS IN LIMIT)
NO
S4703
NONE OF APPLICABLE REQUEST INFORMATION ?
YES
END (FAILURE IN LIMIT)
NO
COMPARISON INSTANCE ← APPLICABLE REQUEST INFORMATION HEAD INSTANCE
S4704
LIMIT CONDITION REQUEST INFORMATION
S4705
S4706
NO
SUCCESS IN LIMIT ?
YES
END (SUCCESS IN LIMIT)

FIG. 48

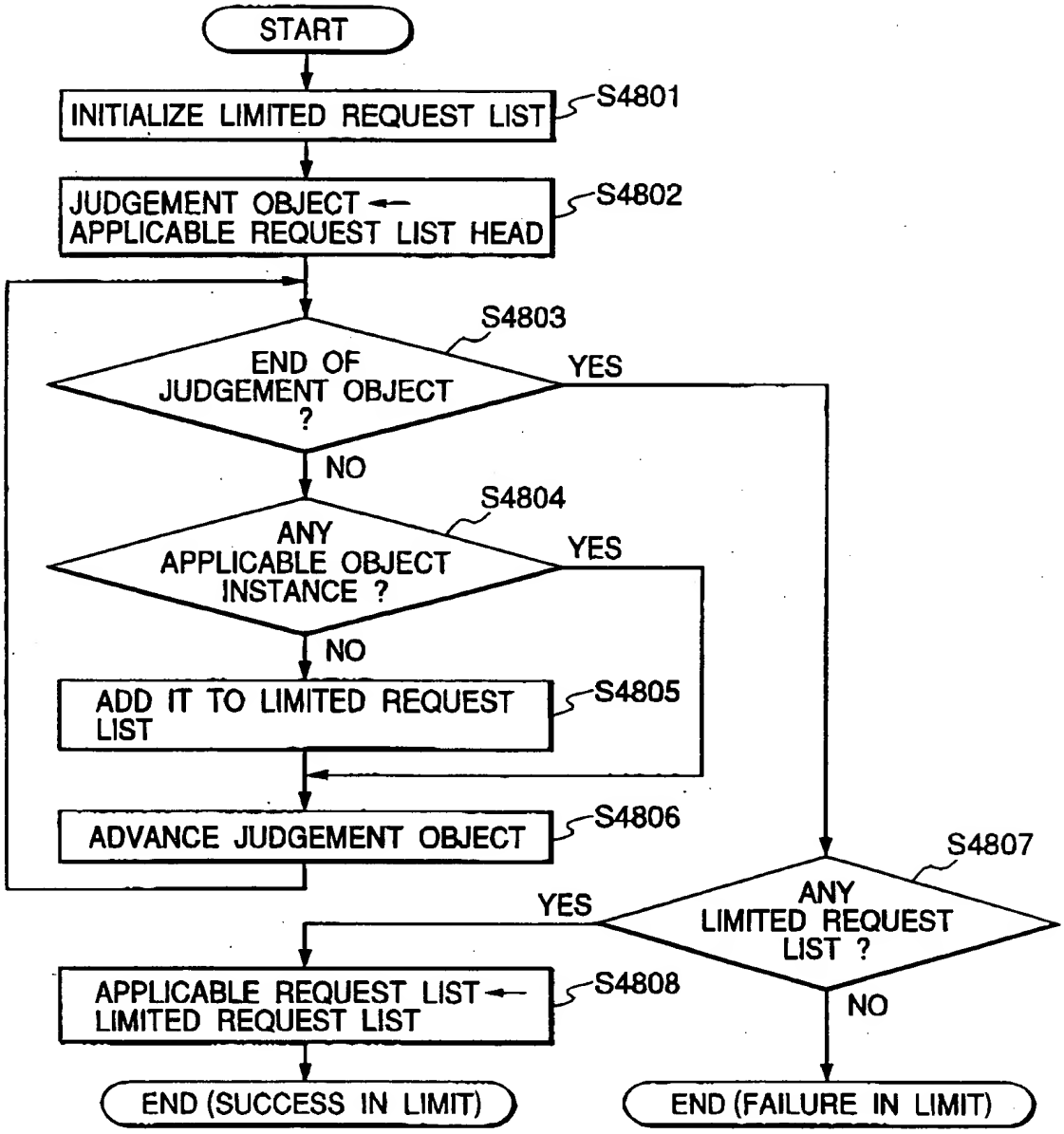

START
INITIALIZE LIMITED REQUEST LIST
S4801
JUDGEMENT OBJECT ← APPLICABLE REQUEST LIST HEAD
S4802
S4803
END OF JUDGEMENT OBJECT ?
YES
NO
S4804
ANY APPLICABLE OBJECT INSTANCE ?
YES
NO
ADD IT TO LIMITED REQUEST LIST
S4805
ADVANCE JUDGEMENT OBJECT
S4806
S4807
ANY LIMITED REQUEST LIST ?
YES
NO
APPLICABLE REQUEST LIST ← LIMITED REQUEST LIST
S4808
END (SUCCESS IN LIMIT)
END (FAILURE IN LIMIT)

FIG. 49

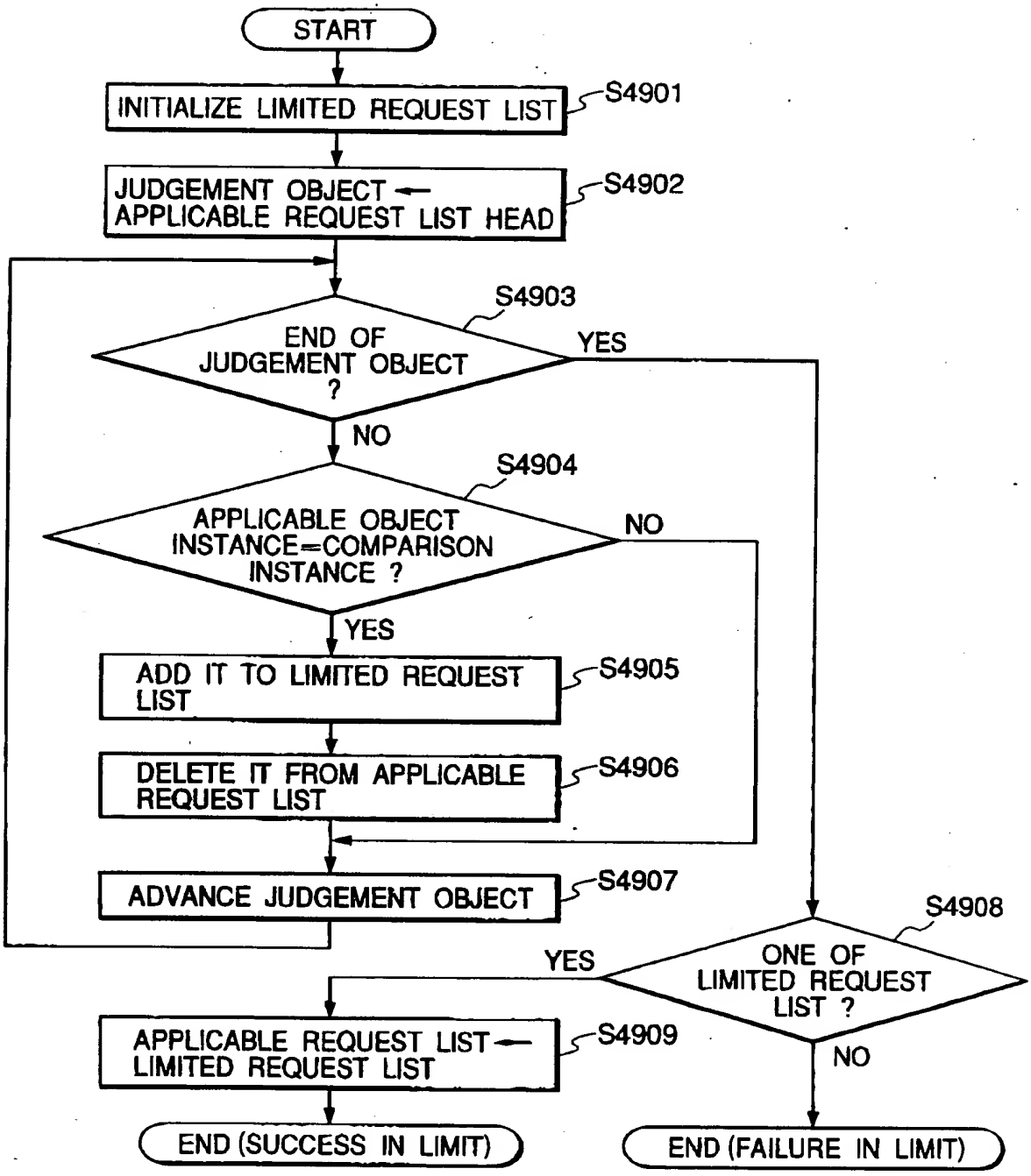

START
INITIALIZE LIMITED REQUEST LIST
S4901
JUDGEMENT OBJECT ← APPLICABLE REQUEST LIST HEAD
S4902
S4903
END OF JUDGEMENT OBJECT ?
YES
NO
S4904
APPLICABLE OBJECT INSTANCE=COMPARISON INSTANCE ?
NO
YES
ADD IT TO LIMITED REQUEST LIST
S4905
DELETE IT FROM APPLICABLE REQUEST LIST
S4906
ADVANCE JUDGEMENT OBJECT
S4907
S4908
ONE OF LIMITED REQUEST LIST ?
YES
NO
APPLICABLE REQUEST LIST ← LIMITED REQUEST LIST
S4909
END (SUCCESS IN LIMIT)
END (FAILURE IN LIMIT)

FIG. 50

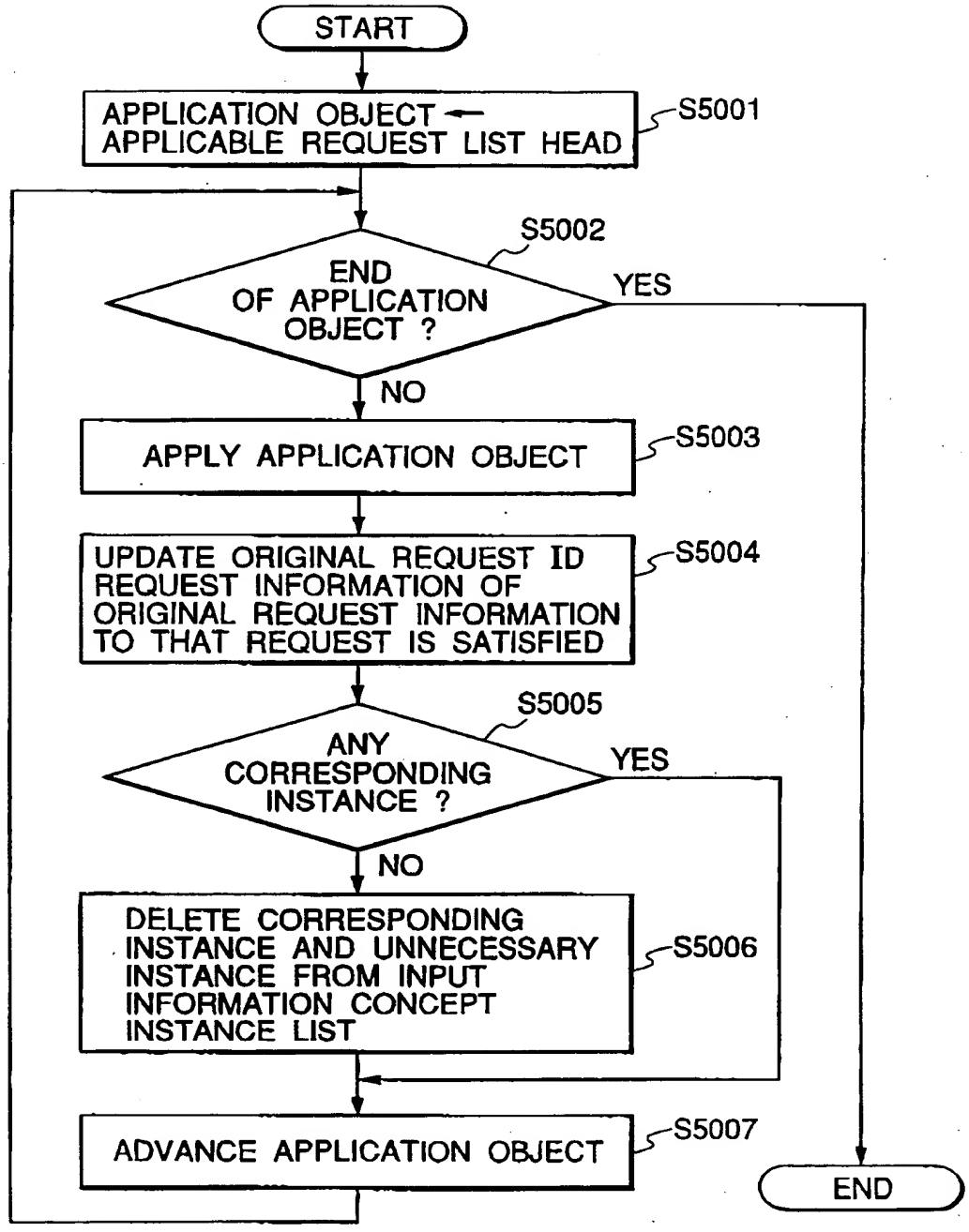

START
APPLICATION OBJECT ← APPLICABLE REQUEST LIST HEAD
S5001
END OF APPLICATION OBJECT ?
S5002
YES
NO
APPLY APPLICATION OBJECT
S5003
UPDATE ORIGINAL REQUEST ID REQUEST INFORMATION OF ORIGINAL REQUEST INFORMATION TO THAT REQUEST IS SATISFIED
S5004
ANY CORRESPONDING INSTANCE ?
S5005
YES
NO
DELETE CORRESPONDING INSTANCE AND UNNECESSARY INSTANCE FROM INPUT INFORMATION CONCEPT INSTANCE LIST
S5006
ADVANCE APPLICATION OBJECT
S5007
END

FIG. 51

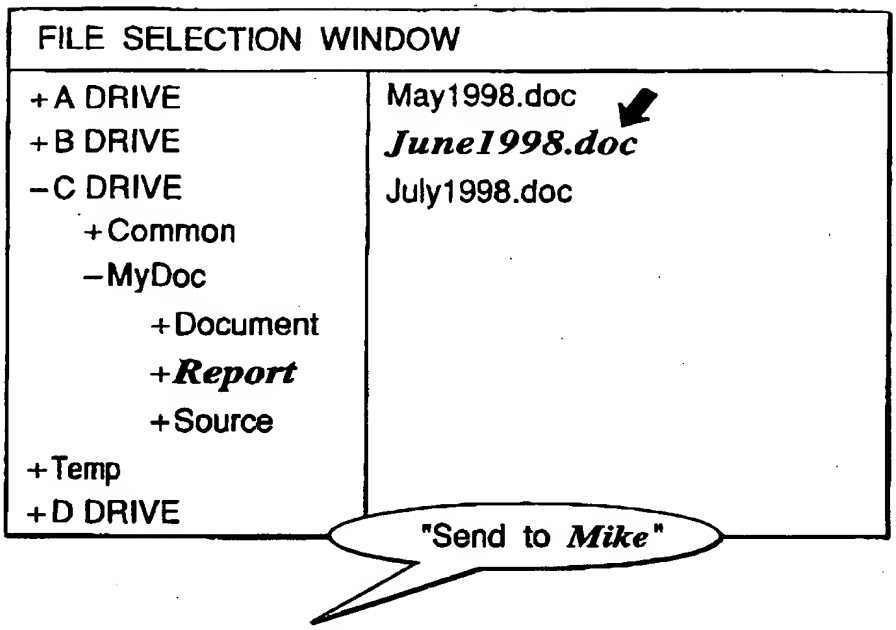


FIG. 52

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	File
Name	"c: MyDoc\Report\June1998.doc"

CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	IMAGE SCREEN OPERATION	CONCEPT 1

FIG. 53

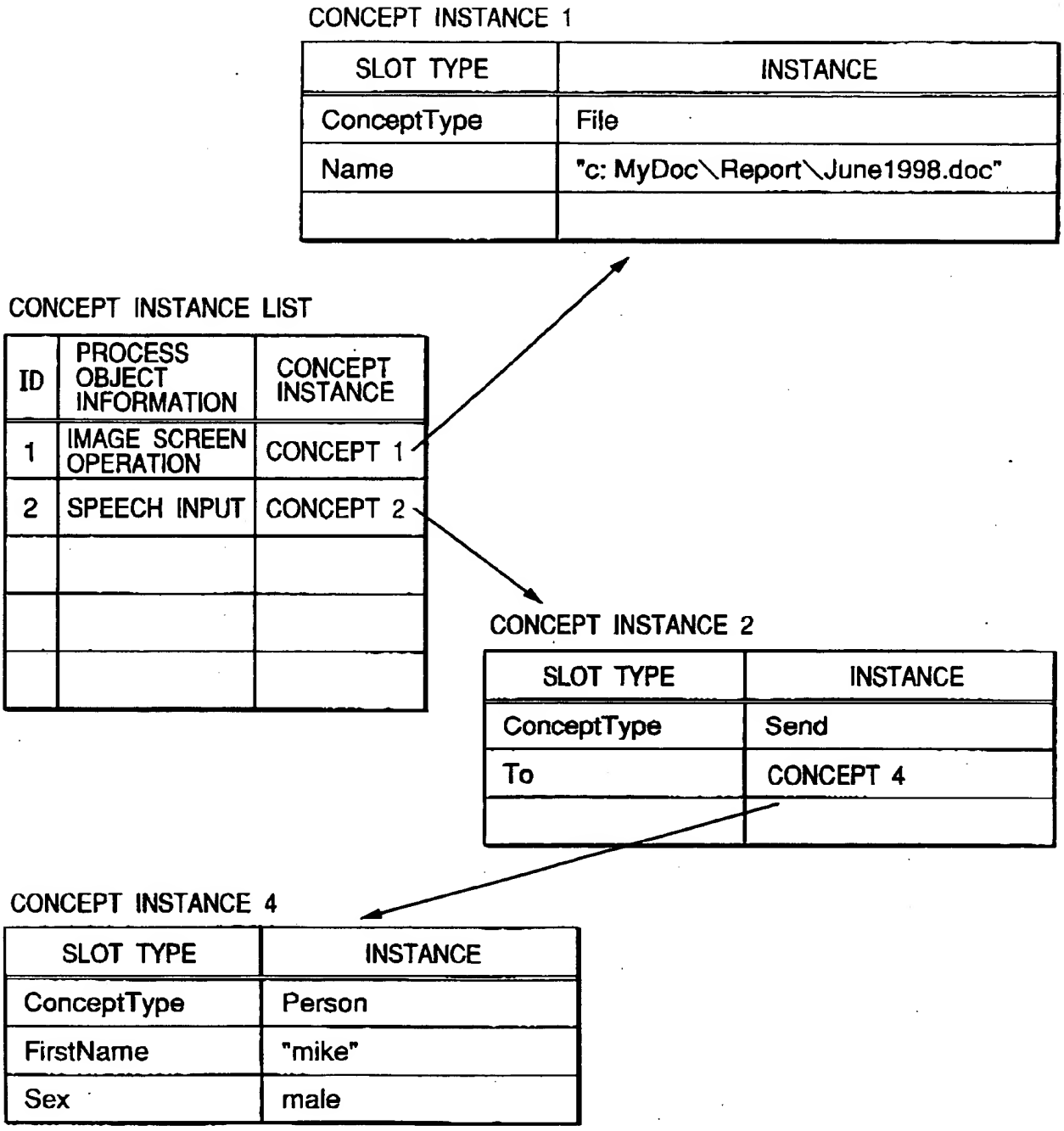

CONCEPT INSTANCE 1
SLOT TYPE
INSTANCE
ConceptType
File
Name
"c: MyDoc\Report\June1998.doc"
CONCEPT INSTANCE LIST
ID
PROCESS OBJECT INFORMATION
CONCEPT INSTANCE
1
IMAGE SCREEN OPERATION
CONCEPT 1
2
SPEECH INPUT
CONCEPT 2
CONCEPT INSTANCE 2
SLOT TYPE
INSTANCE
ConceptType
Send
To
CONCEPT 4
CONCEPT INSTANCE 4
SLOT TYPE
INSTANCE
ConceptType
Person
FirstName
"mike"
Sex
male

FIG. 54

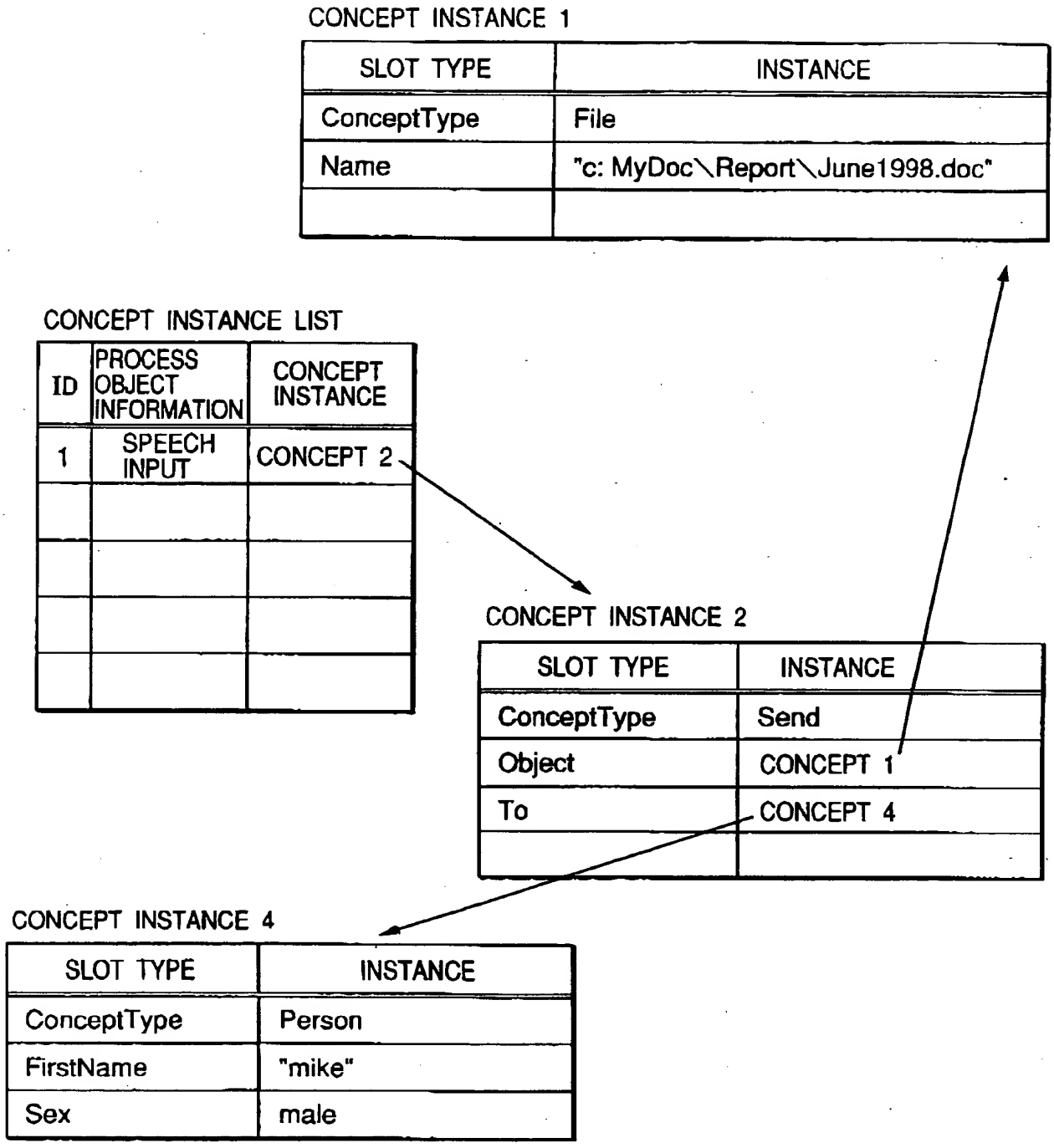

CONCEPT INSTANCE 1
SLOT TYPE
INSTANCE
ConceptType
File
Name
"c: MyDoc\Report\June1998.doc"
CONCEPT INSTANCE LIST
ID
PROCESS OBJECT INFORMATION
CONCEPT INSTANCE
1
SPEECH INPUT
CONCEPT 2
CONCEPT INSTANCE 2
SLOT TYPE
INSTANCE
ConceptType
Send
Object
CONCEPT 1
To
CONCEPT 4
CONCEPT INSTANCE 4
SLOT TYPE
INSTANCE
ConceptType
Person
FirstName
"mike"
Sex
male

FIG. 55

CONCEPT File DEFINITION

SLOT TYPE	INSTANCE APPLICATION RULE	INSTANCE REQUEST RULE
Concept Type	File	File
Name	CHARACTER STRING	CHARACTER STRING

FIG. 56

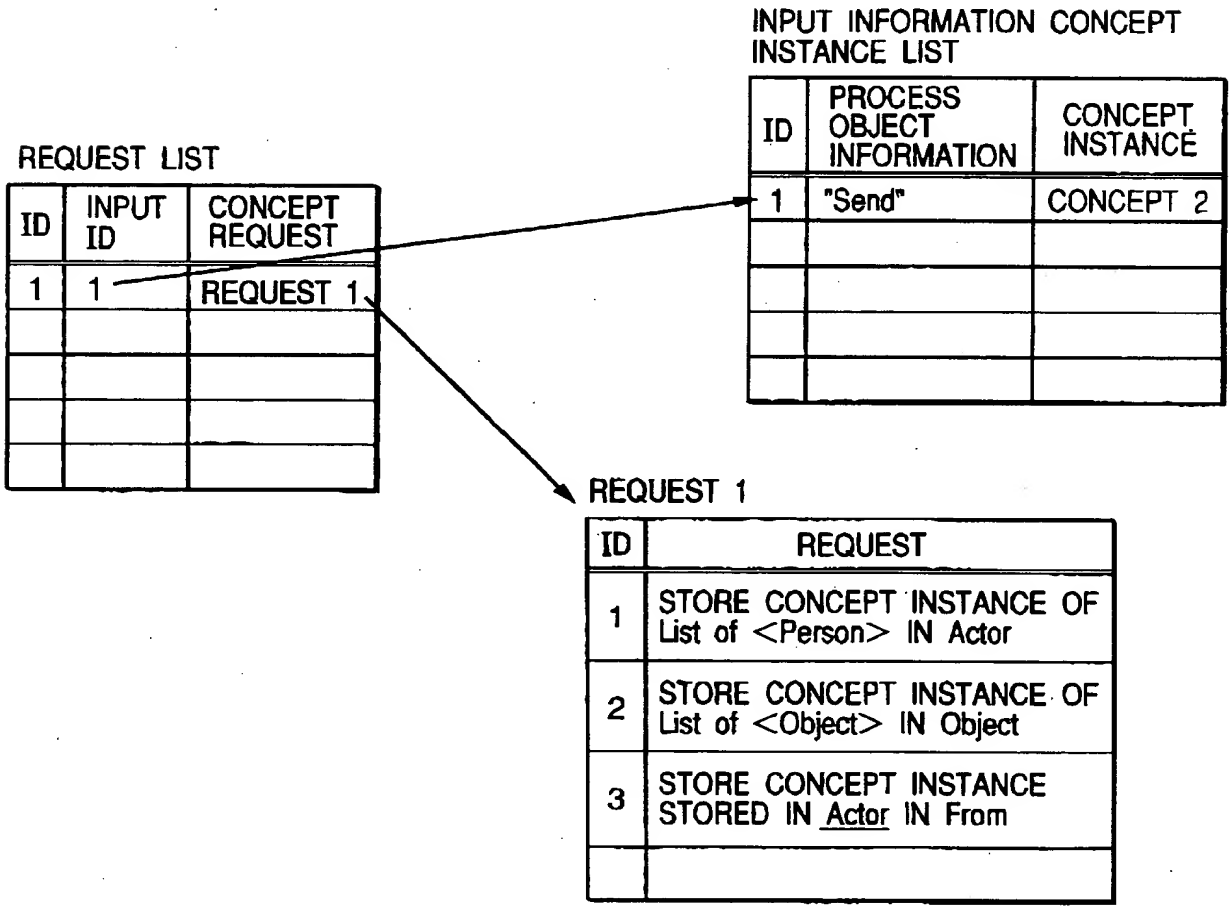


FIG. 57

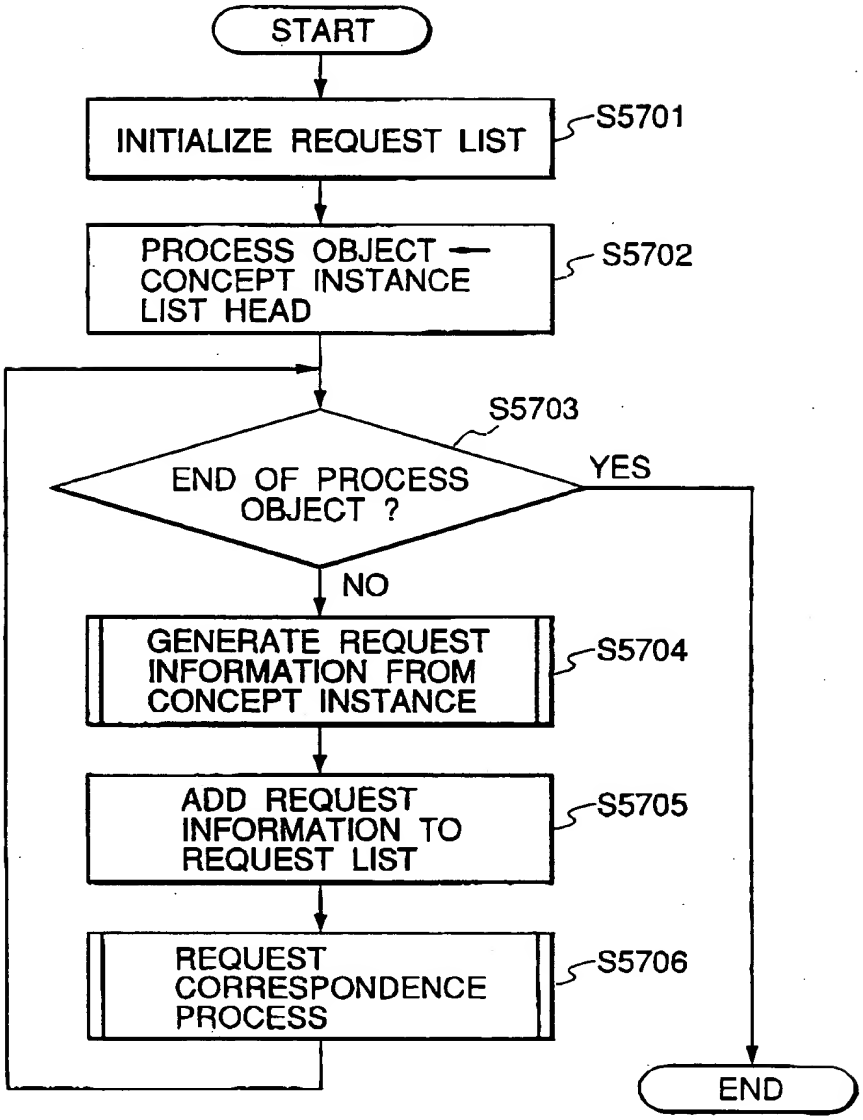

START
INITIALIZE REQUEST LIST
S5701
PROCESS OBJECT ← CONCEPT INSTANCE LIST HEAD
S5702
S5703
END OF PROCESS OBJECT ?
YES
NO
GENERATE REQUEST INFORMATION FROM CONCEPT INSTANCE
S5704
ADD REQUEST INFORMATION TO REQUEST LIST
S5705
REQUEST CORRESPONDENCE PROCESS
S5706
END

FIG. 58

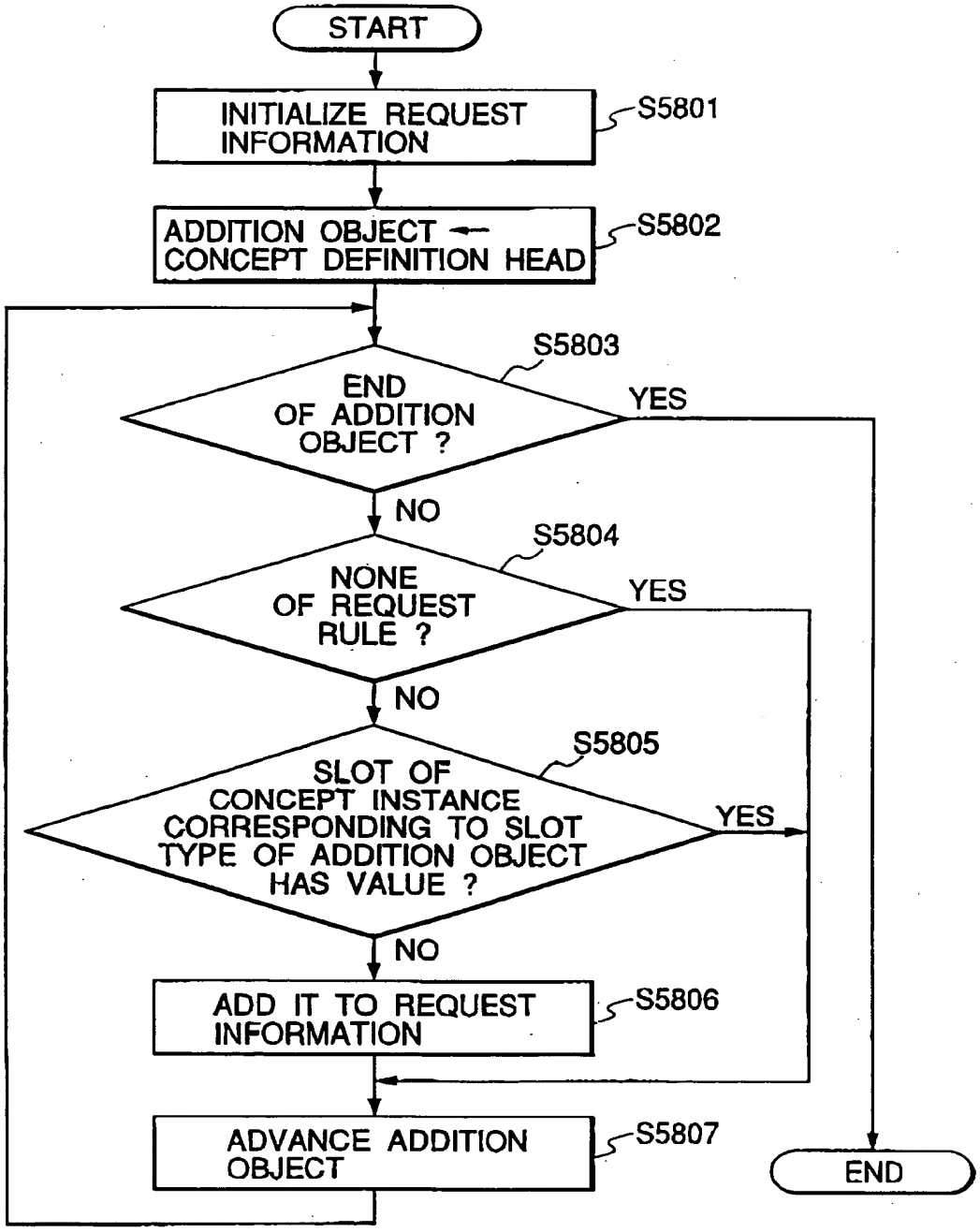

START
INITIALIZE REQUEST INFORMATION
S5801
ADDITION OBJECT ← CONCEPT DEFINITION HEAD
S5802
S5803
END OF ADDITION OBJECT ?
YES
NO
S5804
NONE OF REQUEST RULE ?
YES
NO
S5805
SLOT OF CONCEPT INSTANCE CORRESPONDING TO SLOT TYPE OF ADDITION OBJECT HAS VALUE ?
YES
NO
ADD IT TO REQUEST INFORMATION
S5806
ADVANCE ADDITION OBJECT
S5807
END

FIG. 59

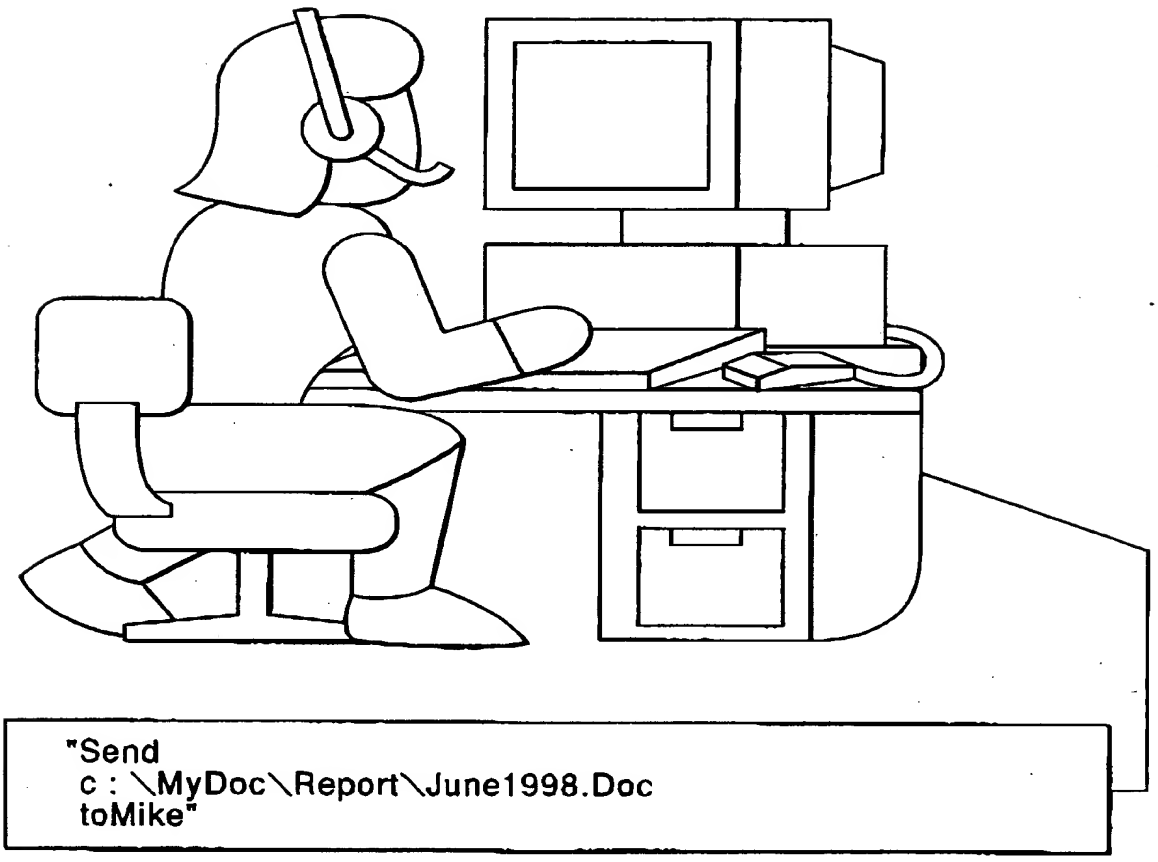


FIG. 60

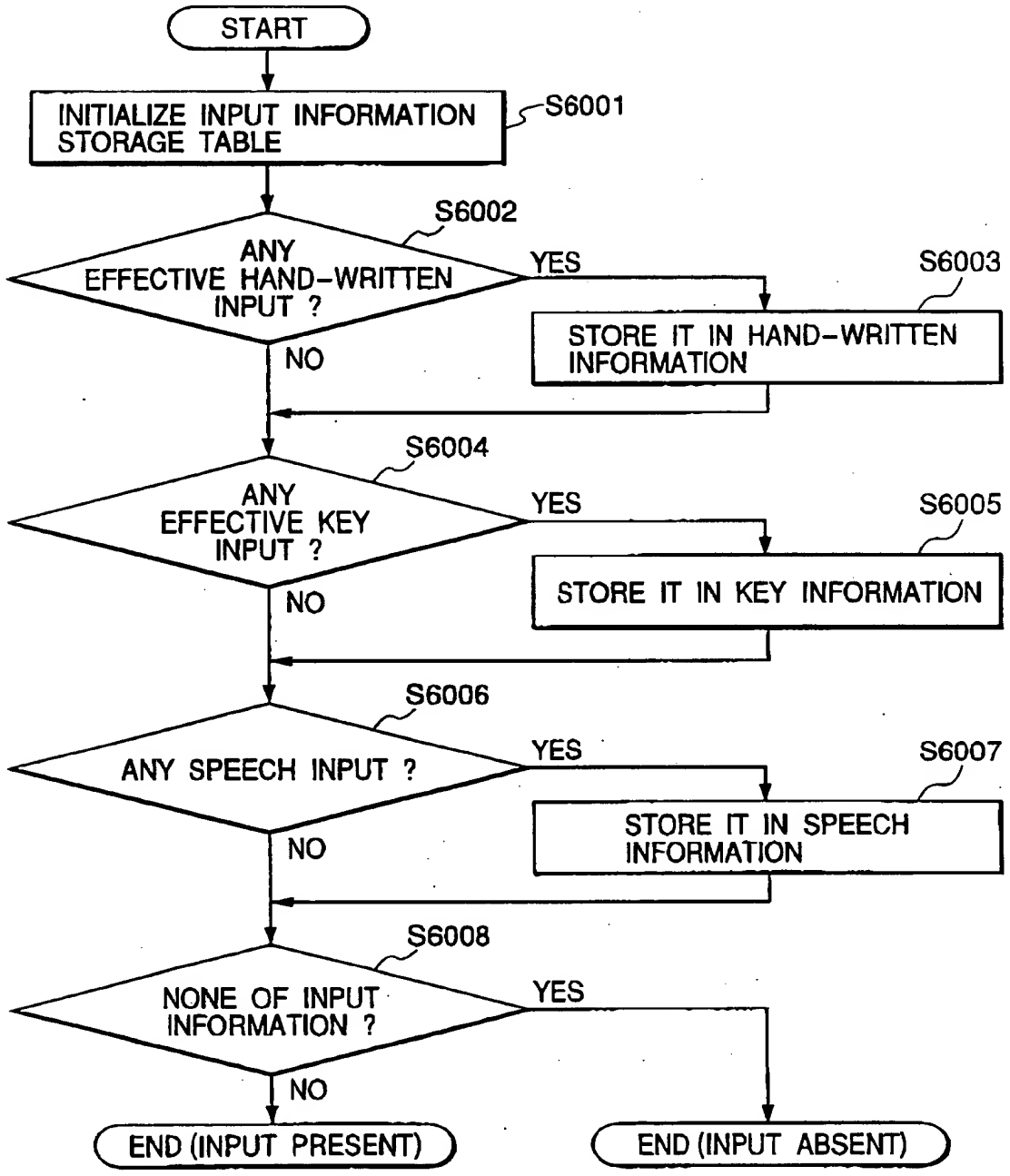

START
INITIALIZE INPUT INFORMATION STORAGE TABLE
S6001
S6002
ANY EFFECTIVE HAND-WRITTEN INPUT ?
YES
S6003
STORE IT IN HAND-WRITTEN INFORMATION
NO
S6004
ANY EFFECTIVE KEY INPUT ?
YES
S6005
STORE IT IN KEY INFORMATION
NO
S6006
ANY SPEECH INPUT ?
YES
S6007
STORE IT IN SPEECH INFORMATION
NO
S6008
NONE OF INPUT INFORMATION ?
YES
NO
END (INPUT PRESENT)
END (INPUT ABSENT)

FIG. 61

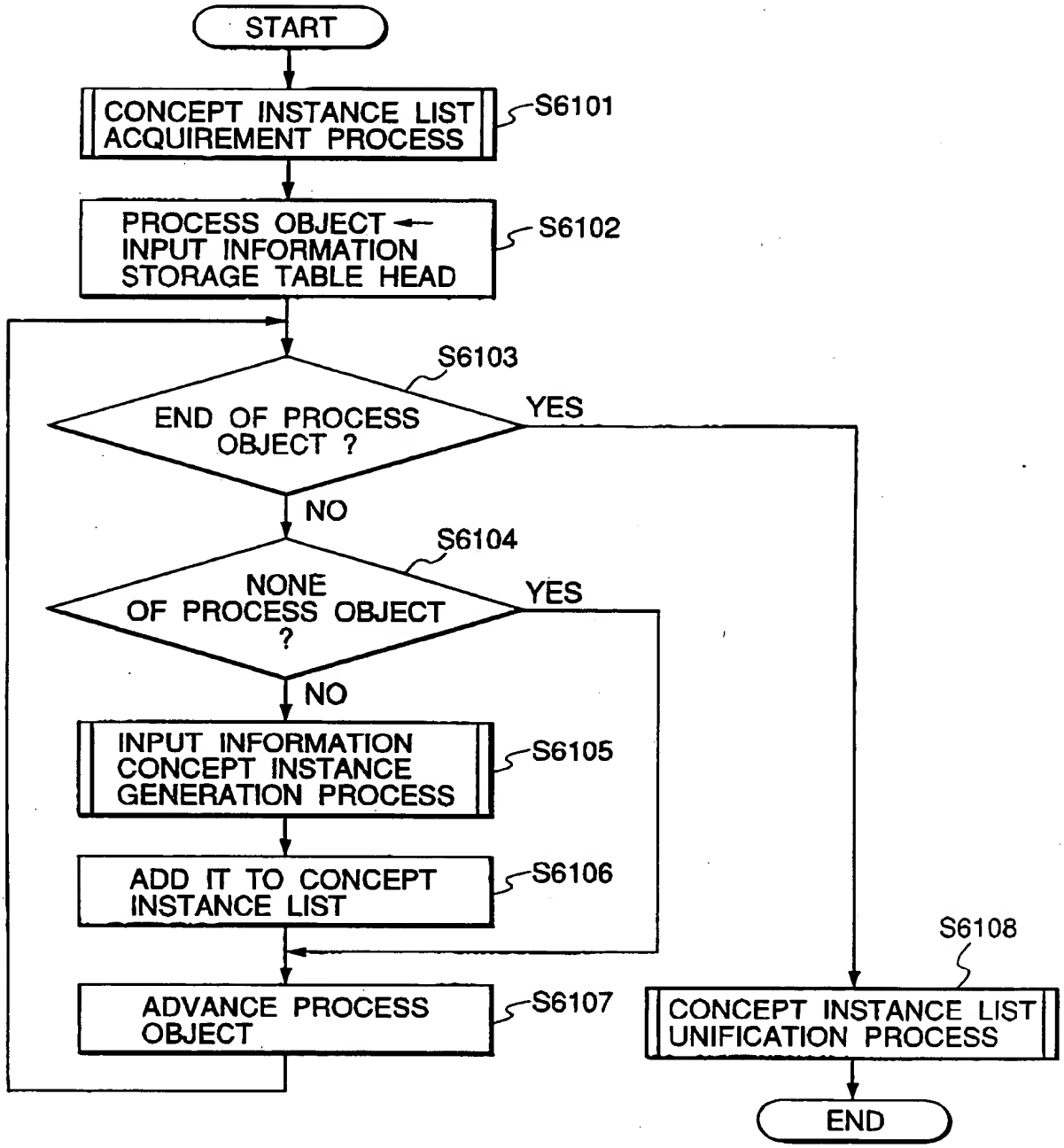

START
CONCEPT INSTANCE LIST ACQUIREMENT PROCESS
S6101
PROCESS OBJECT ← INPUT INFORMATION STORAGE TABLE HEAD
S6102
S6103
END OF PROCESS OBJECT ?
YES
NO
S6104
NONE OF PROCESS OBJECT ?
YES
NO
INPUT INFORMATION CONCEPT INSTANCE GENERATION PROCESS
S6105
ADD IT TO CONCEPT INSTANCE LIST
S6106
ADVANCE PROCESS OBJECT
S6107
S6108
CONCEPT INSTANCE LIST UNIFICATION PROCESS
END

FIG. 62

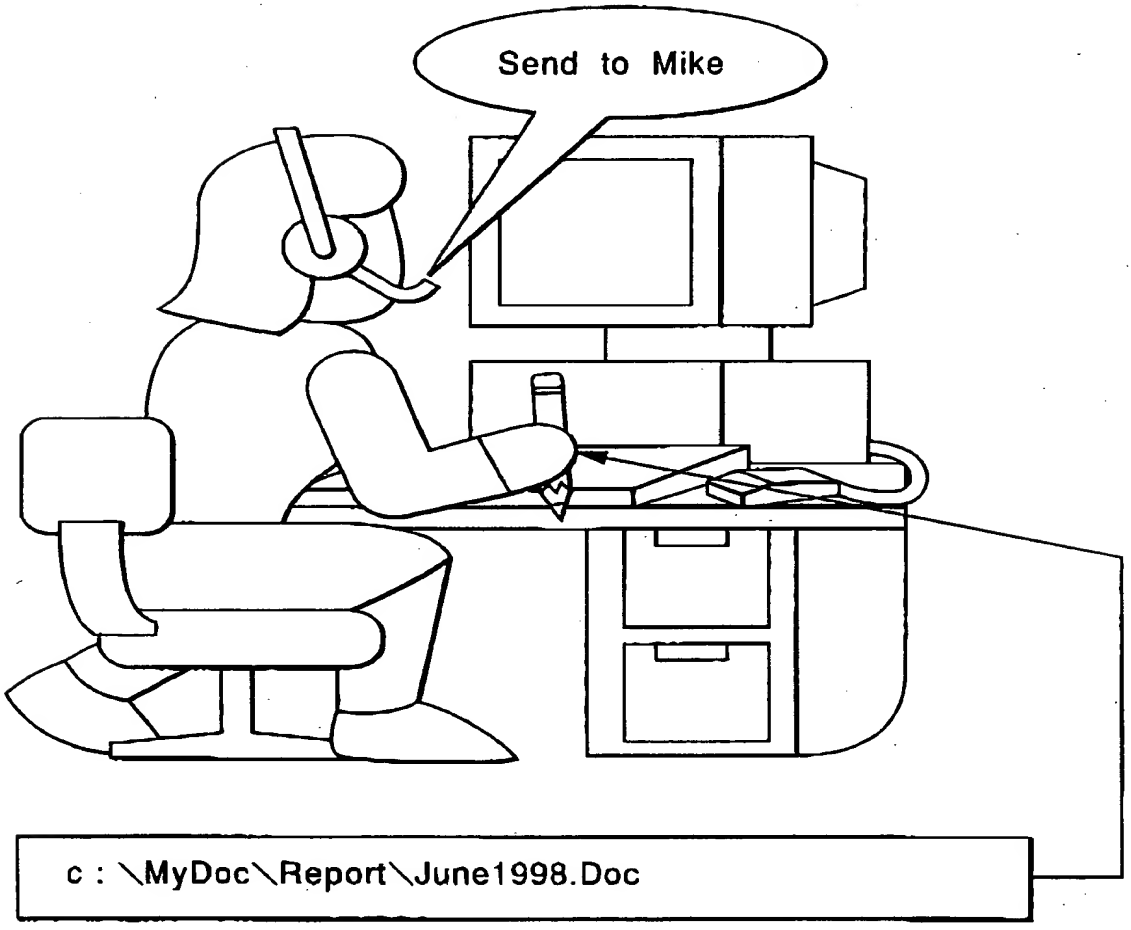


FIG. 63

INPUT INFORMATION STORAGE TABLE

INPUT ID	KIND	CONTENTS
1	HAND-WRITTEN INFORMATION	"c: \MyDoc\Report\June1998.Doc"
2	KEY INFORMATION	" "
3	SPEECH INFORMATION	"Send to Mike"

FIG. 64

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	File
Name	"c: MyDoc\Report\June1998.doc"

CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	HAND-WRITTEN INPUT	CONCEPT 1

FIG. 65

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	File
Name	"c: MyDoc\Report\June1998.doc"

CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	HAND-WRITTEN INPUT	CONCEPT 1
2	SPEECH INPUT	CONCEPT 2

CONCEPT INSTANCE 2

SLOT TYPE	INSTANCE
ConceptType	Send
To	CONCEPT 4

CONCEPT INSTANCE 4

SLOT TYPE	INSTANCE
ConceptType	Person
FirstName	"mike"
Sex	male

FIG. 66

CONCEPT INSTANCE 1

SLOT TYPE	INSTANCE
ConceptType	File
Name	"c: MyDoc\Report\June1998.doc"

CONCEPT INSTANCE LIST

ID	PROCESS OBJECT INFORMATION	CONCEPT INSTANCE
1	SPEECH INPUT	CONCEPT 2

CONCEPT INSTANCE 2

SLOT TYPE	INSTANCE
ConceptType	Send
Object	CONCEPT 1
To	CONCEPT 4

CONCEPT INSTANCE 4

SLOT TYPE	INSTANCE
ConceptType	Person
FirstName	"mike"
Sex	male

FIG. 67

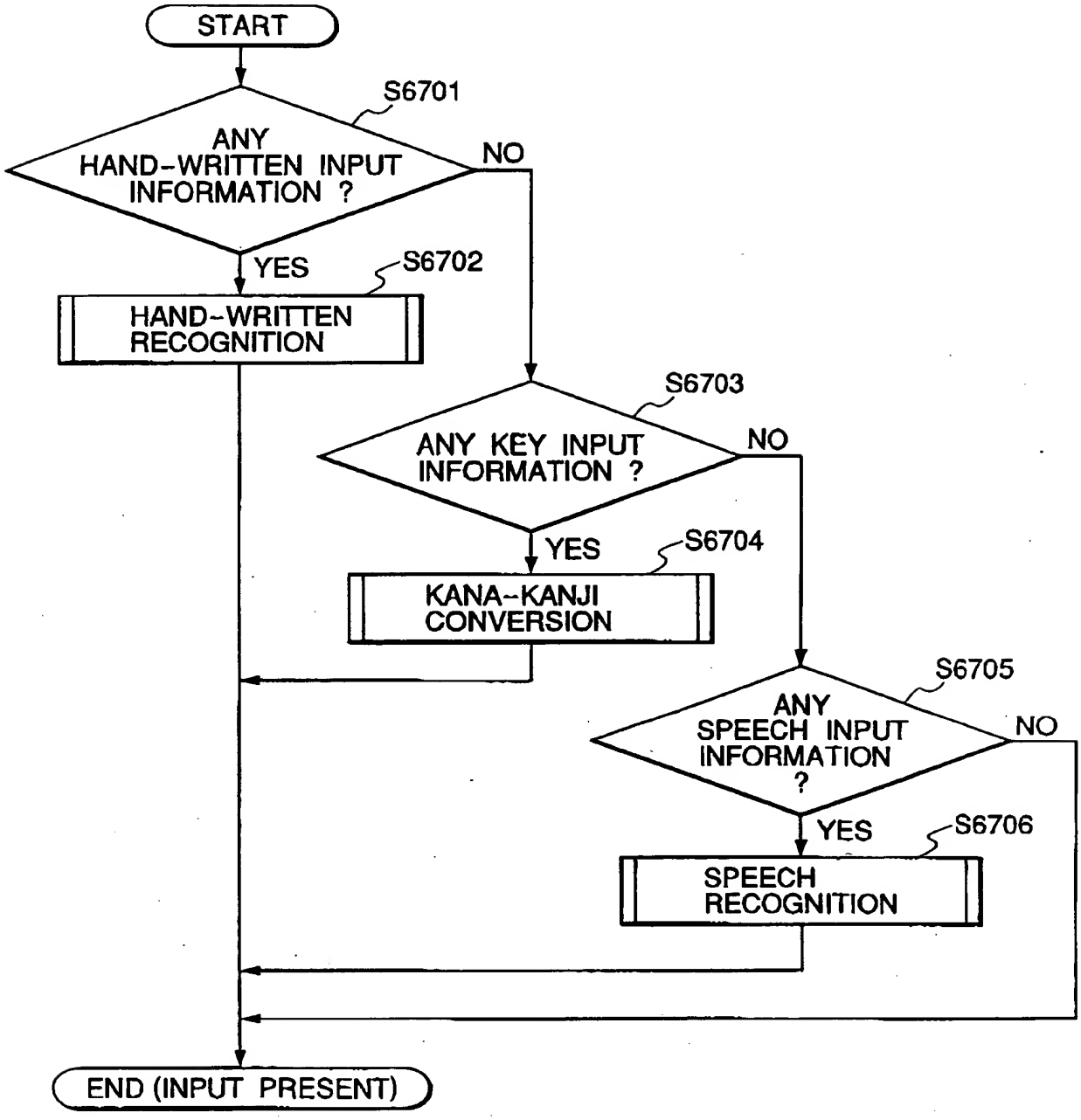

START
S6701
ANY HAND-WRITTEN INPUT INFORMATION ?
NO
YES
S6702
HAND-WRITTEN RECOGNITION
S6703
ANY KEY INPUT INFORMATION ?
NO
YES
S6704
KANA-KANJI CONVERSION
S6705
ANY SPEECH INPUT INFORMATION ?
NO
YES
S6706
SPEECH RECOGNITION
END (INPUT PRESENT)

FIG. 68

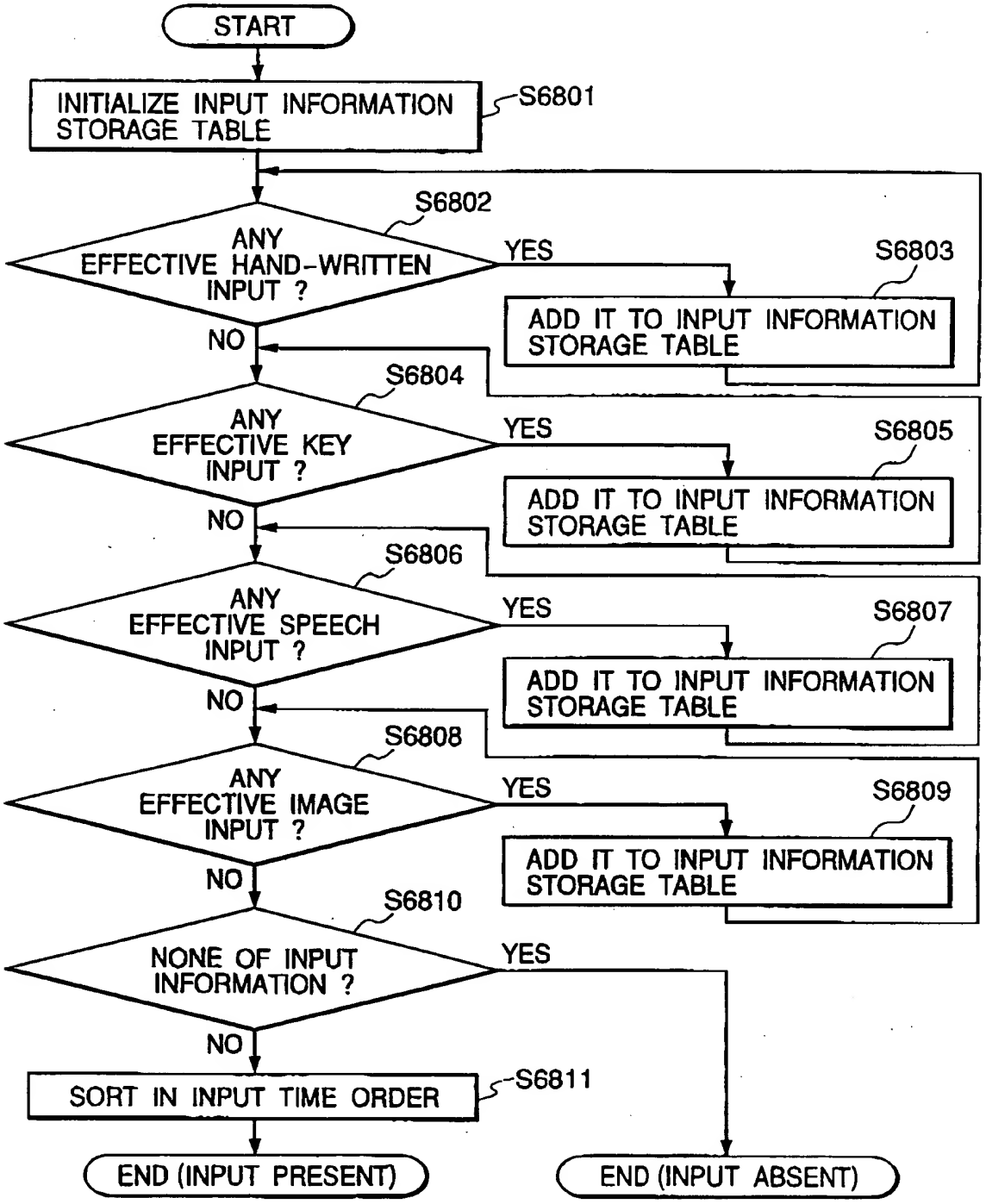

START
INITIALIZE INPUT INFORMATION STORAGE TABLE
S6801
S6802
ANY EFFECTIVE HAND-WRITTEN INPUT ?
YES
S6803
ADD IT TO INPUT INFORMATION STORAGE TABLE
NO
S6804
ANY EFFECTIVE KEY INPUT ?
YES
S6805
ADD IT TO INPUT INFORMATION STORAGE TABLE
NO
S6806
ANY EFFECTIVE SPEECH INPUT ?
YES
S6807
ADD IT TO INPUT INFORMATION STORAGE TABLE
NO
S6808
ANY EFFECTIVE IMAGE INPUT ?
YES
S6809
ADD IT TO INPUT INFORMATION STORAGE TABLE
NO
S6810
NONE OF INPUT INFORMATION ?
YES
NO
SORT IN INPUT TIME ORDER
S6811
END (INPUT PRESENT)
END (INPUT ABSENT)

FIG. 69

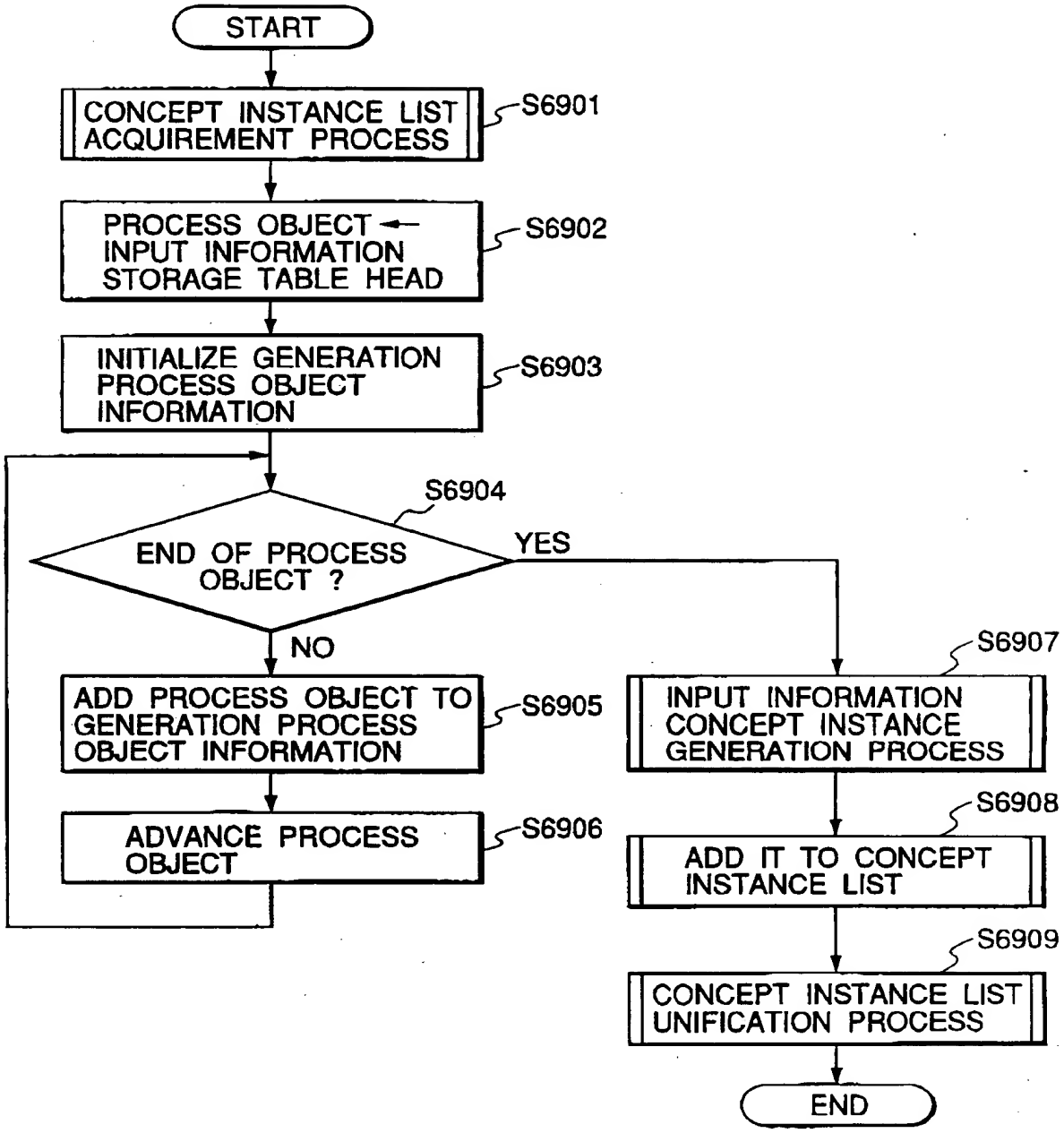

START
CONCEPT INSTANCE LIST ACQUIREMENT PROCESS
S6901
PROCESS OBJECT ← INPUT INFORMATION STORAGE TABLE HEAD
S6902
INITIALIZE GENERATION PROCESS OBJECT INFORMATION
S6903
S6904
END OF PROCESS OBJECT ?
YES
NO
ADD PROCESS OBJECT TO GENERATION PROCESS OBJECT INFORMATION
S6905
ADVANCE PROCESS OBJECT
S6906
S6907
INPUT INFORMATION CONCEPT INSTANCE GENERATION PROCESS
S6908
ADD IT TO CONCEPT INSTANCE LIST
S6909
CONCEPT INSTANCE LIST UNIFICATION PROCESS
END

FIG. 70

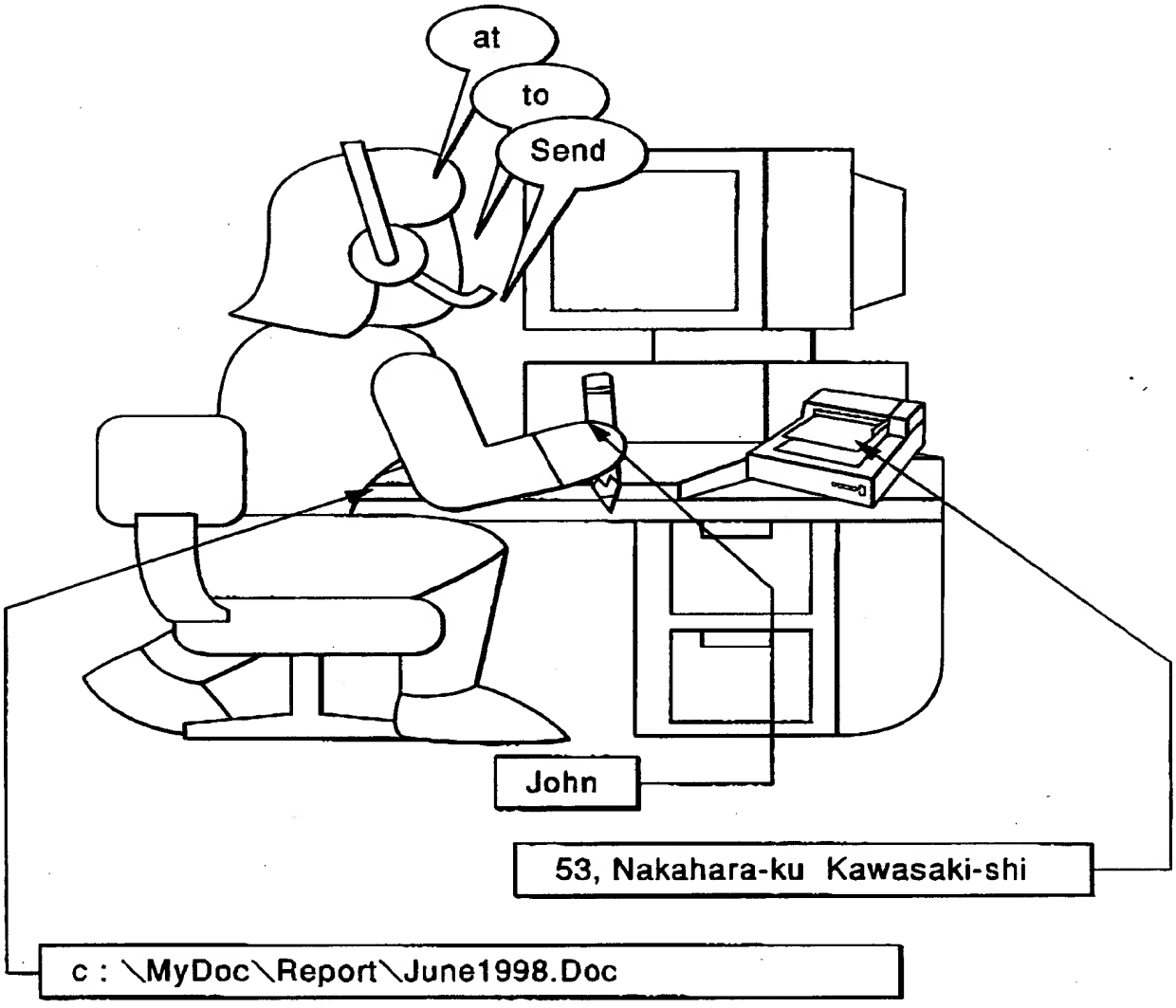
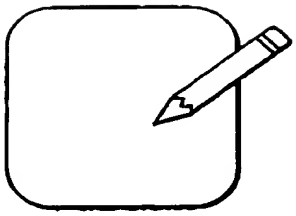
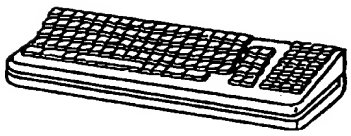

at
to
Send
John
53, Nakahara-ku Kawasaki-shi
c : \MyDoc\Report\June1998.Doc

FIG. 71



HAND-WRITTEN INPUT INFORMATION STORAGE TABLE

INPUT TIME	CONTENTS
13 : 45 : 14	"John"



KEY INPUT INFORMATION STORAGE TABLE

INPUT TIME	CONTENTS
13 : 45 : 12	"c : \MyDoc\Report\June1998.Doc"

SPEECH INPUT INFORMATION STORAGE TABLE

INPUT TIME	CONTENTS
13 : 45 : 11	"Send"
13 : 45 : 13	"to"
13 : 45 : 15	"at"

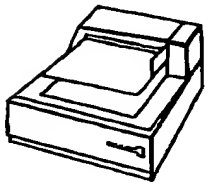


IMAGE INPUT INFORMATION STORAGE TABLE

INPUT TIME	CONTENTS
13 : 45 : 16	"53, Nakahara-ku Kawasaki-shi"

FIG. 72

INPUT INFORMATION STORAGE TABLE

INPUT ID	INPUT TIME	KIND	CONTENTS
1	13 : 45 : 11	SPEECH INFORMATION	"Send"
2	13 : 45 : 12	KEY INFORMATION	"c : \MyDoc\Report\June1998.Doc"
3	13 : 45 : 13	SPEECH INFORMATION	"to"
4	13 : 45 : 14	HAND-WRITTEN INFORMATION	"John"
5	13 : 45 : 15	SPEECH INFORMATION	"at"
6	13 : 45 : 16	IMAGE INFORMATION	"53, Nakahara-ku Kawasaki-shi"

FIG. 73

INPUT INFORMATION CONCEPT INSTANCE GENERATION PROCESS INFORMATION

"Send c: \MyDoc\Report\June1998.Doc to John at 53, Nakahara-ku Kawasaki-shi"